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ORIGINAL ARTICLES

CONGENITAL IDIOPATHIC DILATATION OF THE COLON.*

A. E. SOHMER, M. D.,
Mankato, Minn.

This form of chronic intestinal stasis, due to a congenital deformity, and characterized by an enlargement, both lengthwise and in diameter, of the whole or the distal portion of the colon, is found clinically in various degrees of development.

The typical case, found in children and adolescents, shows an enormous distension of a thin-walled abdomen, in striking contrast to the gaunt appearance of face, chest and extremities; a horizontal wide-spread costal arch; and is associated with very obstinate and prolonged constipation.

Another type, usually found in adults, with less manifest signs, presents itself clinically with very obstinate constipation, evidence of toxic absorption, neurasthenia, and intermittent "phantom tumor," due to recurrent distension of a dilated colon. This type can be recognized by the barium meal and clysma, a method of diagnosis which shows up the true extent of the disease.

This latter less marked type is of especial clinical interest, because of its greater frequency.

Both types are amenable to surgical treatment. If left alone, these cases are attended by a train of symptoms due to malnutrition, toxic absorption and distress, which makes the

condition of the patient a deplorable one, leading to neurasthenia and chronic invalidism.

Yet if the true organic condition is recognized, and differentiated from chronic functional constipation, organic obstruction of the terminal ileum or cecum, and from neurasthenia due to other causes, brilliant results can be obtained by surgical means.

Patients who seek aid for the cure of a chronic obstinate constipation, and who do not respond to proper dietetic, mechanical and tonic treatment of suspected functional or reflex atony of the bowel, at operation will present two distinct types of organic deformity. Either the trouble is in the terminal ileum or cecum, due to bands or veils which cause kinking or other mechanical interference with normal bowel movement; or there is a normal ileocecum, but an enlarged, distended, atonic colon.

The teachings of Lane, Jackson, Eastman, and others have resulted in putting the ileocecum and ascending colon into the limelight, and the operative results in selected cases have been quite satisfactory; especially after the release of kinking bands and adhesions. In the more advanced cases of atony of the ascending colon, at first ileo-sigmoidostomy, or resection of the colon had been advocated, but in that type of case the best results seem to follow a resection of the ascending colon and ileo-colostomy just beyond the hepatic flexure.

In this paper emphasis is laid on a type of case in which the terminal ileum and ascending colon is normal, but where there is an abrupt dilatation and hypertrophy of the distal colon, sometimes involving the transverse and the descending colon, but always the sigmoid colon

*Read at the annual meeting of the Minnesota State Medical Association at St. Paul, October 11 and 12, 1917.



Fig. 1.

Case J. S.—2393—Age 7 years.



Fig. 2.

Fig. 1.—Lateral view before operation, showing immense protrusion.

Fig. 2.—Lateral view after operation, showing normal abdomen.

and its mesentery. The rectum is usually not involved. This condition is congenital and of unexplained origin.

Dr. J. M. T. Finney of Baltimore, in 1908 presented a valuable and exhaustive review and bibliography of congenital idiopathic dilatation of the colon, usually called Hirschsprung's Disease. (Congenital Idiopathic Dilatation of Colon; Finney, J. M. T., Baltimore; Surgery, Gynecology and Obstetrics, Vol. 6, pages 624-643.)

The theories of its etiology are well discussed in that paper, and are, in short, as follows:

1. An abnormally long mesentery, causing a torsion of the sigmoid, chronic congestion of the vascular and lymphatic elements, with consequent hypertrophy of the respective bowel wall.
2. A disease "sui generis," both the dilatation and hypertrophy being congenital, or one being secondary to the other.
3. A chronic colitis with gas distension.
4. An abnormal congenital length of colon, causing exaggeration and multiplication of loops of colon.

5. Mechanical obstruction, causing compensatory hypertrophy above the site of obstruction.

6. A congenital aplasia of the muscular tunics of the large intestine immediately above the rectum, the attempt to overcome the stagnation resulting in dilatation and hypertrophy of the proximal colon.

7. A spastic contraction of the sphincter ani.

8. A neuro-muscular defect of a portion of the lower colon.

9. Abnormal valve formation in the intestine.

10. Lymphangiectasis, causing enlargement of mesocolon and corresponding colon—a hypernutrition—a species of giantism.

There are other less plausible causative factors mentioned in the literature.

One of our cases, the history of which will be given, corresponds very much with that of Finney's, in that there was a hypertrophy of the mesocolon, a thickening and lengthening, with dilatation of the enclosed vascular structures, corresponding to the section of enormously dilated colon. The dilatation began and ended



Fig. 3.

Fig. 3.—Anterior view before operation, showing lateral protrusion of abdomen, and high, wide costal arch.



Fig. 4.

Fig. 4.—Anterior view after operation, showing normal size of abdomen, and comparative protrusion of costal arch.

abruptly, with apparently normal bowel above and below. The years of atony and obstruction which preceded the surgical intervention, caused a partial atony proximally, as shown by subsequent barium plates; however, the sacculation due to normal longitudinal bands above the diseased area, was in marked contrast to the dilated hypertrophied colon which was removed.

The most prominent symptom of the disease is the very obstinate constipation, there being no bowel movement for days, weeks, and even months, the bowels never moving without mechanical assistance. The most evident sign of the disease is an enlarged abdomen, either a constant enormous dilatation, as in one of our cases, or an intermittent enlargement as in the other of our cases—the patient thinking there was a tumor, which however disappeared at intervals. The outline of the distended colon can usually be seen, and is of changeable form, especially during the use of enemata or irrigations. Malnutrition causes a dull, sallow, gaunt appearance of face and body, in marked con-

trast to the distended abdomen. There are secondary symptoms due to toxic absorption. The fecal discharges are dry masses, often without odor, sometimes peculiarly offensive. These patients usually do not vomit, have no gastric symptoms and no pain, unless irritated by violent cathartics, which may develop a reverse peristalsis in the proximal canal. The condition, however, being congenital and of slow progression, allows the body to adapt itself, and gives rise to comparatively few constitutional symptoms, excepting psychic and neurasthenic disturbances, these being even more marked than those secondary to malnutrition. Besides observation of these signs and symptoms, the diagnosis is made definite by barium meal and clysma with X-ray.

The prognosis is uncertain; the disease is rarely rapidly fatal, but secondary conditions may develop in time and lead to chronic invalidism and death. If the patient is in condition for surgical intervention, and this can be applied properly, the prognosis is good.

Treatment consists in resection of the dilated segment of colon, with anastomosis of the proximal normal colon to the upper rectum. It is safe only to do this in several stages. At first a cecostomy is made, for two reasons: it will act as a safety valve after subsequent resection, and it is used to establish through and through irrigation of the colon and rectum for several weeks before the radical operation. One can get rid of much fecal accumulation in this way, and it gives opportunity to improve the general nutrition and resistance of the patient. At the second operation the affected colon is removed, and proper anastomosis made between the normal proximal and distal colon. A rectal tube introduced through the anus and extending beyond the site of anastomosis above and attached properly, is a factor of safety. The temporary colostomy is continued for a couple of weeks longer, and then closed by suture and plastic repair of the abdominal wall. Tonic and hygienic treatment of the patient, and a re-education of the bowel to normal function, require careful consideration and application afterwards.

During the past year we have observed three cases of congenital colon dilatation, one very typical in a boy, and two which involved the sigmoid only in young adults. The typical case and one of the adults were treated successfully by operative method; the other adult case is under observation, and has not yet been operated.

J. S. 2393, male, age 7 years. Has had largely distended abdomen since birth. Very obstinate constipation, bowels never having moved spontaneously since birth, not responding to drugs or diet, but requiring flushings with soap water combined with abdominal massage. Longest time without bowel movement was two weeks, then moved only after flushing. Often required soaking of bowel contents to soften feces.

Has a poorly nourished, pasty appearance. Nutrition only fair. Vomits occasionally. Very good appetite. No discomfort, except psychic; is depressed by his appearance. Has never been sick otherwise. Lower margin of ribs widely distended, by rounded protruding abdomen. Abdominal wall very thin. Contour of distended intestinal coils plainly visible, chang-

ing after enemata with massage. Areas of tympany alternating with dullness, on percussion of abdomen. Heart and lungs normal; urine negative. Pulse, temperature and respiration negative. Somewhat anemic. Von Pirquet test negative. Roentgenologic examination gave the following findings:

Two and one-half hours after barium meal, additional barium water being given immediately before examination, shows on fluoroscopic screen, an abdomen much distended with gas in upper portion. Lower portion shows considerable dense material, extending from pubes up to one inch above the umbilicus. Diaphragm and lower border of heart crowded up to third interspace. Stomach outline indistinct; stomach displaced to right of abdomen. Because of general density of intestines, due to suspected impacted fecal masses, the barium in intestine is indistinct. Upper level of density is not changed materially by change of position of patient.

Viewed laterally—the stomach can be seen pressed backward toward the spine, with a large area of gas anterior to it. A partition-like shadow extends from about the costo-sternal angle downward and backward to upper border of stomach; then from lower border of stomach it curves downward and forward to symphysis pubes. Another area of gas distension is seen posterior to this partition and above the stomach, extending up to the diaphragm. The small intestines, partially filled with barium, are to be seen below the stomach and posterior to the lower partition.

Fluoroscopic examination after barium elysma, given seven hours after barium meal, shows the cecum and ascending colon in normal position, though portions of transverse colon can be indistinctly seen. The rectal ampulla can be distinctly outlined, but the outlines of sigmoid have disappeared, and no descending colon can be distinguished from the general diffuse opaque mass. The plate findings of the stomach and intestines entirely corroborate with the screen findings, both in antero-posterior and lateral views. The plate taken after the barium elysma shows the cecum in normal position and of about normal size, and the hepatic colon in normal outline; as the colon extends to the left, it can be seen to become wider until

it has reached a diameter of 14 c. m. Another distinct view of the distended colon can be seen in the lower and left portion of the abdomen: this portion has a diameter of 18 c. m. at its widest portion. The rectal ampulla is well outlined for 10 c. m. as it approaches the anus. Clinical diagnosis: Megacolon (Hirschsprung's Disease).

In preparation for operation the patient was given ricinus oil, which he vomited, and which made him feel badly. The bowel was washed out by rectal irrigation as thoroughly as possible—the inadequacy of which was revealed during subsequent operation.

On February 26, 1917, the first operation was done, for exploration and preliminary colectomy, under nitrous oxide and oxygen anesthesia. A chronic inflamed appendix with surrounding adhesions was found; the cecum, ascending and hepatic colon were normal. Dilatation began in transverse colon, and continued to rectum. The descending and sigmoid colon was enormously hypertrophied, and dilated, and contained a large fecal mass. The appendix was removed and surrounding adhesions relieved, and the cecum was attached to the abdominal wall in the right inguinal region; the inguinal wound packed without opening the cecum. The right rectus abdominal incision was closed.

On February 28th, two days later, under nitrous oxide and oxygen anesthesia, the cecum was opened and a medium sized rubber tube sutured into the fistula for drainage of the ileum and irrigation of the colon. From this day until March 19th, for nineteen days, daily irrigation of the colon, through and through, from cecal opening to anus and reversely, was made with soapsuds and salt solution, aided by massage, to empty the colon of the large accumulated fecal masses; mineral oil was also injected, to aid in their solution and dislodgment. While large fecal masses were in this way removed, yet it was found later, that in spite of this apparent thoroughness, only a tunnel was cut through the mass. However, the abdomen became considerably smaller.

On March 19th, under nitrous oxide and oxygen and ether anesthesia, the whole distended bowel was removed through a median incision. The mass consisted of descending

colon and sigmoid, about 36 c. m. long and 18 c. m. in diameter, containing several pounds of impacted feces in one mass. End to end anastomosis was made between the splenic flexure and rectum, a large rectal tube being attached to the upper segment, and carried through the anastomosis, the rectum and anus. The site of the anastomosis was drained with a split tube containing gauze, through a stab wound in the left inguinal region. The median abdominal wound was closed. The rectum, in spite of subsequent irrigations, continued to hold thickened fecal masses, so that on March 27th, eight days later, it was necessary to remove this mass manually through the anus. The peculiar inspissation of feces in all parts of the affected bowel resisted solution by water, soap, salt and oil, so that a tunnel would form between the mass and the bowel wall, through which the irrigating fluids would pass.

On April 4th, sixteen days after the colectomy, the cecal colostomy was closed by suture.

Convalescence continued, and on April 20, a month after the colectomy, the patient left the hospital, much improved in health and nutrition. For a few weeks more, it was necessary to use a daily enema, which was followed about an hour later by spontaneous movements—the first he had since birth. The boy gained in weight rapidly—his flesh became firm, and he was very happy. The psychic improvement was especially noted.

A roentgenogram taken May 31, ten weeks after operation, shows a normal colon as far as the splenic flexure. From that point down to the site of anastomosis with the rectum, there is a moderate dilatation of the colon, which is about $8\frac{3}{4}$ c. m. at its widest diameter, and about 21 c. m. long. At the site of the anastomosis, the lumen is somewhat constricted, being 2 c. m. in diameter. Below this point the ampulla is of fairly good dimension. The colon is in good position. The distension above the anastomosis is due, no doubt, to the weakened functional condition of the colon wall because of its congenital inactivity; but with increased general nutrition and developmental growth, and regular bowel movements, this will probably assume good functional condition. The contrast between the radiograms before and after the

operation is as marked as the improved appearance and health of the boy.

On September 22d, six months after operation, enemata are no longer necessary; but he is given a bowel tonic occasionally. He has practically normal bowel function. The abdomen is of normal size, and the abdominal muscles are developing well. The lateral prominence of the lower chest wall is still manifest, but disappearing, and the muscular control of chest and abdominal muscles is about normal. The general health is excellent.

M. A. 9951, female, age 27, single; occupation, teacher. Complains of sacral backache for a number of years; worse on left side in region of sacro-iliac joint, and aggravated during menstrual periods. Anorexia; sometimes distress in stomach after taking food. Abdominal vague pains and distress. Obstinate constipation. Abdomen at times very prominent, as if tumor were present; alternate distension and flatness.

Physical examination shows abdomen distended, but no tumor palpable. Pelvic examination negative. Moderate tenderness in region of left sacro-iliac joint. Moderate lateral curvature of lumbar spine. Pulse and temperature normal. Negative tuberculin test. Heart, lungs and urine negative.

A stereo-roentgenogram of pelvis and spine shows apparently normal sacro-iliac joints. Vertebrae normal contour; lateral curvature, with convexity to right, in upper lumbar region. Supporting corset gives no relief.

On February 14, 1917, laparotomy showed a chronic inflamed appendix and a Lane's kink of the ileum. A very small subperitoneal fibroid of the uterus. Sacro-iliac joints negative. The ascending and transverse colon negative, but the sigmoid is much elongated, dilated, hypertrophied, and thrown into large folds, which occupy the whole lower abdomen. At this time appendectomy and the release of Lane's kink was done, and the small fibroid excised.

After this operation backache was relieved, but the very obstinate constipation persisted, so that two months later it was decided to remove the enlarged portion of colon. At this time (on March 26, 1917), the X-ray findings were as follows: A normal ascending and transverse colon. Beginning about the middle

of the descending colon, a dilatation begins, which extends down to the rectal ampulla; it involves the sigmoid, mainly. A loop of the sigmoid extends from a short distance above the crest of the left ileum, and extends downward towards the right to a point 7 c. m. to the right of the median line. The upper border of the loop is 18 c. m. above the symphysis pubes. Diagnosis: Megacolon, involving the sigmoid colon.

On March 28, 1917, a preliminary colostomy was made, a rubber tube being sutured into the cecum. For a week, through and through irrigation of the colon, from the cecostomy to the anus, was made, to clear the colon.

On April 4, 1917, seven days later, the dilated sigmoid was removed, through a left rectus incision. The specimen was 30 c. m. long and 8 c. m. in diameter; the mesentery was thick and short, causing an excessive twisting of the sigmoid. The proximal colon was attached to a rectal tube, and telescoped into the distal end, the tube passing through the rectum and anus, according to Ochsner. Two cigarette drains were inserted, one through a stab wound to the site of the anastomosis, and one through the lower end of the abdominal wound.

The patient made an uneventful recovery. The temporary colostomy was closed by purse string of bowel and plastic suture of abdominal wall.

On June 19th, two and one-half months after operation, the patient had gained five pounds, and the bowels were regular, without medicine or enemata. At this time a radiogram taken after a barium clysma, to determine the condition of the colon, showed it to be in good position and of normal lumen above the anastomosis. There is no evidence of constriction of the lumen at the site of anastomosis, and the general appearance of the colon is nearly that of a normal individual.

Summary.

It is this latter type of case that is of especial clinical importance, because of the relative obscurity of the symptoms, the true condition being best determined by the Roentgen ray.

The true type of Hirschsprung's Disease, of which the first case reported here is typical, is amenable to surgical cure, if the patient is in fair condition.

The operation should be done in separate stages; first a colostomy; then a resection; and then closure of the colostomy, with sufficient intervals between the three steps.

Careful preparation before operation, and observation afterwards, improves the safety of the treatment and the degree of final results.

CLINICAL PHARMACOLOGY OF DIGITALIS; HISTORICAL SKETCH.

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M. O. T. C., Fort Riley, Kansas.

"In 1914, in the United States, one out of every nine deaths was attributable to some affection of the heart. This disorder now has the distinction of taking more lives than any other disease. It causes more deaths than all diseases of the lungs combined. In the year 1914 the death rate was 150.8 per 100,000, as compared with 125.1 in 1900." This statement comes from one of the largest fraternal insurance orders and from statistics carefully compiled by them from all sources. It shows decisively the relative importance of this malady.

With this thought in mind, we may, with renewed interest, attack the study of cardiac conditions not alone from the pathological, but also from the clinical and pharmacological standpoints. On the clinical side, through the use of improved methods of diagnosis, and with the help of mechanical devices such as the cardiograph and polygraph, wonderful results have been obtained by a more careful inspection and observation of the heart's action together with careful study of the various functional activities of the body. All of which assist in a careful diagnosis and permit of a rational treatment.

Thus we are able to accomplish results of a remarkable nature. Studies also from a pharmacological standpoint have been one of the stronger factors of ease betterment. Referring to any authority on cardiac medication, it will be seen that the first drug discussed is digitalis. Hirschfelder, in his work on Diseases of the Heart and Aorta, in the beginning of the chap-

ter on the effect of drugs in cardiac disease, says: "Foremost among the drugs used in the treatment of circulatory diseases are the preparations of digitalis." Croftan voices the general sentiment also: "It is the chief representative of the group of heart tonics or stimulants."

From the time of Withering down to the present, our chief bulwark in the treatment of cardiac conditions has been digitalis. The rationale of the old German adage is as manifest today as when it was written, that "the experienced physician can be distinguished from the inexperienced one by the way in which he uses digitalis."

Many other drugs have been advanced, but none has given the results or shown the marked improvement noted in most cardiac cases following the administration of digitalis. Many times, though, the older practitioner in a serious case of decompensation has administered the drug with disappointment in the result, the patient showing little or no improvement. Then his faith in digitalis has weakened and for a time he gives up its use, resorting, with poor success, to the other drugs, later to return to digitalis. Then a similar case comes to hand, he administers foxglove as in the preceding case, the results are marvelous, and he wonders as to digitalis therapy. Such has been the experience of most busy practitioners from the time of Withering down to the present.

Intense has been the interest and voluminous have been the writings on the subject. Much careful work has been done from a research standpoint, and within the past few years we are arriving at definite results, so that now we are able to regulate our cardiac cases, administering our drug with practically mechanical preciseness and securing constant results.

Digitalis was introduced to the medical profession by Withering of Birmingham in 1784, who observed the results accomplished by an old woman who was said to have restored to health many cases of cardiac dropsy with a mixture whose principal ingredient was foxglove. Witherington's directions have since been followed as to the time of gathering and drying, that is, "at the supposed time of greatest activity of the plant, just before or at the time of flowering." This means the use of sec-

ond year leaves, as the plant is a biennial; and though there have been a few references to the use of first year leaves, the statements of Withering as to its selection have been followed. Christison of Edinburgh in '48 says in reference to the leaf "their bitterness which probably measures their activity is very intense both in February and September, and their extract is highly energetic as a poison in April before any appearance of the flowering stem."

Pereira, in 1850, makes the first authoritative statement as to the actual use of the first year leaves. From that time down to the present there are occasional references as to the relative toxicity of the first and second year leaves, though up to the present time the second year leaf has been considered the standard.

Digitalis is officially described as "the dried leaves of *digitalis purpurea* linne, containing not more than 2 per cent stems, flowers and other foreign matter, with a slight characteristic odor and bitter taste. The tincture digitalis contains 100 grams of pulverized leaf to 1000 c. c. The infusion contains 15 grams to 1000 c. c."

A great deal is yet to be determined as to the exact chemistry of digitalis, as to the nature of the changes which may occur from time of gathering and the changes that may occur in the various preparations after they have been compounded. The therapeutics of digitalis, on the other hand, has been developed to a remarkable degree and brilliant results achieved.

Cohn in a recent article brings out the summation of ideas of effective digitalis dosage, "a dose which borders on toxicity." Eggleston sums up the therapeutic effects to be desired and describes them, using the phrase "clinical improvement." These effects are: "a decrease of pulse and respiratory rates; a more or less rapid subsidence of dyspnea, orthopnea and persistent cough; clearing of the lung bases; in fibrillation, a decrease in the pulse deficit, or the difference in rate as felt at the radial and apex; the clearing of a congested liver and splanchnic region with the loss of pulsation and tenderness and diminution in size; the clearing of cyanosis and cold extremities; disappearance of oedema; and increase in urinary output."

These are the ideal results that have always been sought in digitalis therapy, but many times this complex of clinical improvement has been accomplished only in part, then the physician has resorted to other drugs as strophanthus, etc., and the outcome has not been the one fully desired. A prescription for digitalis is written by the physician and dispensed by a good pharmacist as either the tincture, the infusion, or some other form, and it does not give constant results—either the action has been faint with little or no clinical improvement, or the toxicity has been intense. Of late years other forms of digitalis have been put on the market and the results from their use have been more constant, but their high cost have made them prohibitive in many cases. Among the newer forms are the fat-tree tincture, the glucosides as digitoxin, digitalin, digitalein, digitupuratum, and numerous others. On the whole these have given more constant results than the older forms.

This variation in results has been the subject of most careful study for a great many years, and careful observation has shown that there was a great difference in the strength of the various preparations. Hence, the need of a digitalis of uniform strength, in order that an effective dosage may be determined, is apparent to all.

This idea is fully embodied in an article by Symes in the British Medical Journal. "The preparations of digitalis have been shown to possess a wide variation of activity in their therapeutic action. This wide variation has been found to be due to a certain extent to the leaf rather than to the process of manufacture of the various extractives. Climate, soil weather, etc., all have to do with the metabolism of the plant. Another factor is the proper care and preservation of the gathered leaves." In this connection Hirschfelder says "the strength of digitalis preparations may be estimated either chemically or by their action on animals." The chemical assay is based on the rather uncertain quantitative determination of the digitoxin. The action of the drug on animals may be tested in several ways—on frogs, guinea pigs, cats., etc.

The term "physiologic standardization" has an important place in present day pharma-

ecology and means the estimation of the strength of a preparation by comparing its effects on animals with those of a standard product.

Among the various methods brought forward to test the toxicity of digitalis, the more important are: the 1-hour "frog method" of Faumlener and Lyons; the 12-hour "frog method" of Houghton; the guinea pig method" of Reed and Venderkleed; and the "cat method" of Hatcher. The results obtained from the first three methods vary greatly and many extraneous factors govern the results. For example, in the driving off of the alcoholic content by heat, there may be some alcohol left, or overheating may cause chemical changes which produce a marked variation in the value of results. The sudden change in temperature caused by removing frogs from one room to another, may cause variation. Other factors also are evidenced. Then, too, the results of standardization cannot be transferred to man. The same is true with the guinea-pig method. The "cat method" of Hatcher, according to the deductions of Eggleston, is by far the best method, the most important factor being that the results can be transferred to man. The "cat unit," the term devised by Hatcher in relation to digitalis dosage, may be defined as that amount of drug calculated per kg. of cat which is just sufficient to kill them slowly when continuously injected into the vein, this being expressed in mg. of the drug, whether it be pure principle or the leaf.

The method employed by Hatcher and modified to our use in establishing this unit follows. The cat is weighed, and anesthetized with ether just sufficiently to keep it quiet. It is then placed on the table, a canula is inserted into the femoral vein and attached to a burette containing the preparation to be assayed. The infusion is used full strength (15 gm. of drug to 1000 c. c.); the tincture (10 gm. to 1000 c. c.) is diluted to 1/10 strength with normal salt solution. The heart beat, respiration, and time are carefully recorded; then 10 c. c. of the solution is run into the femoral vein in 5 minutes (rate 2 c. c. per minute); then 1 c. c. every 2 minutes until the heart stops. Careful records of time, pulse rate, respiration, and note as to

various conditions of rhythm, respiration, etc., are made. The heart stops before respiration. The total amount of solution used is noted, also time and rate of injection. The c. c. per kg. is estimated. This averages, in the better grades of leaf, from 7 to 8 c. c. per kg.. The weight of the digitalis represented in the solution is calculated and is expressed in terms mg. per kg. of animal weight. Variation is small and extraneous factors few.

The results of our assays have been constant and only a few factors seem to influence the results. Lactation and pregnancy produce the greatest variation, next come obesity and maturity; otherwise there is practically no variation in results.

All calculations are based on normal totals, aberrant amounts indicating undue tolerance. The tincture and infusion show the greatest stability, and there seems little difference in them, if properly made up from assayed stock, except in concentration.

The problem of digitalis dosage has always been one of keen interest. Though little attention was formerly paid to absorption and excretion (although, for example, in extreme decompensation with resulting splanchnic congestion and vomiting this is a very important factor), recent investigation shows that the tincture is absorbed more rapidly from the gastrointestinal tract than other forms, due to the alcohol present, the greater delay permitting a longer action of the digestive juices, with more or less destruction of the all-important glucosids.

The preparations used in the wards at the University Hospital are principally the infusion and the tincture. Though other preparations are used it has been found that these two, when used in a proper manner, accomplish all and more than the more expensive forms—digitoxin, digitalein, digipoten, digitalin, digipuratum, digalen, etc. Our findings as to digitalin tablets compare well with those of Edmunds and Roth, that immense doses must be given to secure digitalis effect. The fat-free tincture has no advantage over the ordinary tincture, while the cost is to be considered.

The powdered leaves have been used in a number of cases, but our findings are that the

action is slower than either the tincture or the infusion and the tendency to nausea is greater.

The greatest advance in digitalis therapy, and one that produces amazing results, is the method brought out by Eggleston. Formerly, when a patient was bordering on "in extremis" 'tis well said "he would either die or get well before digitalis could get a hold." It has been our experience in the words of the University Hospital that, with Eggleston's system of dosage, the patient's improvement is surprisingly rapid and is without nausea and other toxic symptoms. To my mind it is the method to be used whenever possible. Following the Eggleston dose, it may be advisable to give tonic doses for long periods of time, up to the point of "minor toxicity," then to be discontinued for a time. This condition of minor toxicity is evidenced by extrasystoles, nausea, vomiting, partial heart block, sinus arrhythmia. On the discontinuance of the drug these "apparently intense" symptoms rapidly subside and the patient is bettered to a wonderful degree.

Through the use of the electrocardiograph and the polygraph we have a means of complete control of digitalis dosage. From the patient's normal cardiogram there is a marked change following digitalis administration; within 24 hours the T-wave tends toward inversion first to an isoelectric position, then a negative phase which increases with the amount of the drug exhibited. The p-r interval is lengthened and a complete block may develop. If arrhythmia or fibrillation is present the pulse rate slows markedly and the patient evidences relief.

The polygram in the same manner notes the slowing of the rhythm; the intensely pulsating veins are less distended as the patient improves; and extrasystoles, which may be barely felt at the wrist, are evident.

On withdrawal of the drug, the cardiogram gradually returns to normal, though digitalis effects have been noted for periods of more than forty days after its discontinuance.

Recently we have used in man the intravenous injection of the dilute tincture and the infusion, obtaining immediately marked action with no harmful secondary results. The intravenous dose employed is one-half the Eggleston dose.

The method of Eggleston dosage, and modified to our use, is as follows: First the patient is cardiographed and note is made whether any digitalis effect is evident. If negative, the full dose is given. Even though there may be a digitalis history recorded by the cardiogram, the full dose is given if the condition is urgent, for should intense "minor toxic symptoms" develop, the drug can be stopped any time within the twenty-four hours. If a digitalis history is developed by the cardiogram under ordinary conditions, then a cut of fifteen per cent. is made in the Eggleston dose. If a full dose is indicated, a standardized preparation is selected, the patient's weight being obtained. When administered orally, the average dose of the tincture is about 0.146 cat units, or .146 c. e. per pound of patient's body weight. If the patient weighs 130 pounds, then $0.146 \times 130 = 18.9$ c. e., or about $2/3$ ounce. This is to be given in twenty-four hours. If the infusion is to be given (the factor 0.146 representing the tincture strength), then the same amount of drug in one per cent. (using the preceding figures for tincture) equal 18.9×10 , or 189 c. e., but the infusion is 1.5 per cent, then $189 \times 1.5 = 283.5$ c. e., or about 9 ounces of infusion in twenty-four hours. The dose is given in 4 portions in 24 hours, with 6 hours between each, first giving half the amount, then one-quarter, then one-eighth, and again one-eighth.

If one desires to use this method of Eggleston dosage and has not a standardized digitalis, he may proceed as above, remembering the evidence of minor toxic symptoms and using the drug as compounded by a careful pharmacist from the best quality of leaves. Taking as the "cat unit" 100 mg., proceed as above, the average tincture being about 0.145 c. e., for the tincture times weight, and give in broken doses as above, 6 hours apart.

The Department of Pharmacy of the University of Minnesota has, through the meritorious work of Dr. Newcomb, done remarkable work in growing and preparing the digitalis plant, and any pharmacist may secure through his wholesale druggist this home-grown first-year plant, as a second-year plant will not develop here. Our assays show that this digitalis ranks with the highest grades from any source. A standardized product may be secured by any

physician from them. One of the many varieties of the digitalis family grown by the Department of Pharmacy is of the narrow leaf form, "digitalis lutea." I find it ranks in toxicity with the best grades, with the added important factor that little or no nausea is produced and the tendency to quieting effect is more marked. We are using this drug, both in the form of the tincture and the infusion, with the best results, and we hope before a great while to present important data on this subject.

In closing let me briefly sum up a few of the more important points of digitalis therapy.

1. The great and increasing number of cardiac cases.

2. The former digitalis unreliability, the cause being the lack of standardized drug.

3. The improved methods of diagnosis and the newer digitalis standardization.

4. Securing results—two forms of dosage, the tonic and the Eggleston, with the necessity of attaining a minor toxic action to secure results.

5. Minnesota grows digitalis equal to the best.

6. The new form, digitalis lutea, and its promises.

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STRONGER PUBLIC HEALTH DEPARTMENTS.*

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DEPARTMENT OF PUBLIC HEALTH OF
ILLINOIS.

Inasmuch as I was not notified that I was to appear on this program until a half hour ago, I am in no position to offer an extensive or definite program. The important thing in our relationship with public health departments during the next five years or the next twenty-five years, can be summarized in the phrase "thorough and unselfish co-operation between governmental and extra-governmental agencies." Time was when state and municipal health officials sincerely believed that they could not consistently delegate to extra-governmental organizations any of their authority, and this idea was frequently carried to such an extreme that the public officials refused or failed to avail themselves of the special facilities controlled by private organizations.

*Read at the Meeting of the Mississippi Valley Conference on Tuberculosis, Radisson Hotel, Minneapolis, October 8, 1917.

Within the past few years public health has become everybody's business, and public health officials have been in the embarrassing position at times of having to recognize that the most important public health work in many special lines has been carried out by purely voluntary organizations. This has been particularly true in the prevention and suppression of tuberculosis.

There was a day when residents of Illinois had occasion to be apologetic in the discussion of any public questions. With the enactment of the Civil Administrative Code under the guidance of Governor Lowden, and development of the State Department of Public Health under Doctor C. St. Clair Drake, there have been tremendous changes in Illinois, in which public spirited citizens have come to take very genuine pride.

Since taking office of secretary of the Illinois State Board of Health about five years ago, Doctor Drake has recognized that the official health agencies were not as efficiently equipped to carry out special lines of public health work as some of the private agencies, that the state department covering the whole field of public health could not command the specialized technical skill to be found active in some of the volunteer societies and associations, and so during the past five years the policy of the Health Department of the State of Illinois has been to encourage the co-operation of these extra-governmental agencies.

In dealing with the prevention of blindness, the State Health Department has followed the guidance of the State Association for the Prevention of Blindness and has placed the responsibility for successful preventive work upon the specialists connected with the State Association. The same broad-minded policy of co-operation has existed between the State Department of Public Health and the Illinois Tuberculosis Association, every step forward made by the two organizations being absolutely and harmoniously co-ordinated. At the present time in the

very extensive work, the State Council of Defense, the State Department of Public Health and the Illinois Tuberculosis Association, speak with one voice with the force which comes of united effort and with absolute absence of lost motion.

My experience in connection with official public health work—both municipal and state—has been longer in duration than my connection with volunteer health agencies, and my experience in both has caused me to conclude that wherever a governmental agency is unable to co-operate harmoniously with an extra-governmental agency which is sound and fair, or wherever an extra-governmental agency is unable to co-operate harmoniously with a governmental agency which is sound and fair, that there is at the bottom of their failure to co-operate something that is piffling and trifling, something that is no bigger than petty personal jealousy; and I have no hesitation in saying, although these remarks are made without extensive deliberation, that the most important thing during the next five years in the promotion of tuberculosis work and the development of all public health work, either in the Mississippi valley or elsewhere throughout the nation, lies in impressing public health officials with the fact that there is nothing inconsistent or improper in their co-operation with the people in the protection of the lives and health of the people, and that the lives and health of the people are so tremendously important that it is intolerable that purely personal differences should interfere with their most efficient conservation. Wherever cause for friction between governmental and extra-governmental agencies is found to exist—I care not where—it should be fearlessly and ruthlessly weeded out.

These remarks are not prejudiced and are not biased. I speak both as an officer of a governmental health organization and an officer of a volunteer public health association.

BURSAE.*

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Aside from some well known types, the diagnosis of diseased bursae is somewhat neglected. The orthopedists recognize these conditions at once, and it is another one of the many things to their credit. A knowledge of the exact location of bursae is of great importance. While some bursae have received names and are accurately described, others are but seldom mentioned, and authors differ as to their nomenclature. A further complication is that many are merely accidental. One hundred and seventy-five different names are listed, and in many cases there are multiple bursae under one name.

Anatomically, a bursa is not a distinct organ. A colloid substance develops in a limited space surrounded by a membrane, wholly or in part. Histologically, there is a wall of connective tissue with elastic fibres, the inner surface of which is covered with pavement-epithelium. Where the epithelium is lacking, the tissue is hard and rich in round cells and cells similar to cartilage cells. Functionally, they protect the tissue from pressure and are found anywhere in the body where such protection is necessary.

The bursae may be deep seated or subcutaneous. The former are for the most part placed between a muscle or its tendon and a bone, or the exterior of a joint—less commonly between two muscles or tendons—although, we recently saw one the size of a large potato between the muscles of the thigh. The subcutaneous are interposed between the skin and some firm prominence beneath it. Ely says: "My investigations incline me to the belief that the bursae found in the region of the joints, and where the tendons and muscles play over a bony prominence or upon each other, are true synovial cavities, bursae synoviales, while those found subcutaneously over bony prominences, bursae mucosae, have a different structure."

Synovial bursae often communicate with the cavity of a joint, and may be involved in dis-

ease of that structure. Both are vulnerable to the same influences, and the etiology, pathology, and treatment of bursitis is, therefore, much the same as that of arthritis. Infections elsewhere in the body play an important role, and many forms of bursitis resist treatment until the toxic source is removed. Montgomery, in reporting a case of subdeltoid bursitis, says: "There was no history of trauma in this case. The only probable etiologic factor was repeated attacks of tonsillitis about the time the pain developed in the shoulder." Oschner, in the yearly surgical summary considers this view worthy of mention. Schwarz thinks the etiology of these inflammations is not trauma as is generally assumed, but infection. Stiffness of the joints often follows an attack of angina or tonsillitis and he thinks this extension of the infective organism applies also to bursae. In fact, in so-called articular rheumatism, has not the tendency been to think only of the articular surfaces, forgetting the numerous bursae surrounding each joint, infection of which could cause the local symptoms of inflammatory rheumatism? Gonorrhoea, syphilis, tuberculosis and metabolic diseases such as gout and arteriosclerosis are further considerations. Bursitis has been observed following pyaemia, typhus, scarlet fever and variola.

While in the early studies trauma was considered the sole causation, the theory of infections has steadily gained. Some are so extreme as to insist that it must be traumatic solely or infection only. While, of course, it may be so, yet often, perhaps, given infections present in the body, trauma so prepares the field that culture is encouraged. Personally, we feel that a most thorough search for infection should be made, as of the teeth, tonsils, antrums, infections of the digestive tract, faulty metabolism, the genito-urinary organs, and especially, syphilis and tuberculosis. Such causations should be removed to prevent further encroachments on the body, just as for instance, with a diseased gall bladder, it not only should be removed if indicated; but one should seek the causes in order to restore the patient to the best possible health.

The mucous bursae present somewhat different considerations. "Housemaid's Knee," "Miner's Elbow," "Weaver's Bottom," the fa-

*Read at the Annual Meeting of the Minnesota State Medical Association, St. Paul, October 11 and 12, 1917.

miliar "bunion," are all types of mucous bursae. These bursae are wont to enlarge and fill with fluid as the result of oft-repeated trauma, and often are formed in unusual situations as the result of such trauma. According to Lange-mak, the enlargement is to be regarded as simply an exaggeration of the process which originated the bursa. The pathological process is not an inflammation, but a collagenous degeneration—a hygroma. The hygroma may later become secondarily infected in some acute form or suffer some more chronic change as syphilitic or tuberculous. Because of their less protected location, no doubt, the factor of trauma—the occupational phase being oft-repeated trauma—is more important than in the better protected synovial bursae. But, one must consider the general resistance, knowing that syphilis, tuberculosis, and toxæmias make the vessels more prone to hemorrhage and the tissues more likely to pathological change.

Gunther in discussing affections of the bursae says: "Traumatic bursitis is, of course, local and unilateral, but symmetrical affections may be produced by constitutional or infectious diseases." Syphilis is especially marked by multiplicity and indolence. This leads to further considerations of diagnosis, the necessity of which Codman indicates when he says: "Subacromial bursitis is generally diagnosed as brachial neuritis, periarthritis, muscular rheumatism, circumflex paralysis, contusion of the shoulder joint, fibrous gout, rheumatism, etc." Since watching for this condition more thoroughly, I have been able to help patients whom I know I would have otherwise missed. They usually come with their arm at rest and a diagnosis of neuritis. Codman further says, "that this bursa causes more shoulder joint disability than all other disorders combined, including fractures and tuberculosis." Codman's statement might seem extreme. The other side was pointed out by Dr. D. D. Turnacliffe, Rapid Transit company, in conversing of his work. He said that the journals devoted to their special problems during the past few years have had so many articles on this subject, that the danger was to consider too many things in the region of the shoulder joint bursitis.

Any diagnostic help then is welcome, and X-ray examination should be the routine. Cal-

cium deposits are frequently shown in these bursae. To the inexperienced, they look like broken fragments of bone. While most men claim such depositions are within the bursa, Brickner says they are beneath it. For diagnostic purposes, the disputed point is of no great consequence. Caldwell, in describing a case proven at operation says: "Stereo-roentgenographic examination showed a peculiar irregular shadow, apparently due to some calcium deposit in the neighborhood of the upper and outer surfaces of the great trochanter, suggesting a bursitis." The chief value of the radiogram is, however, in differential diagnosis, in the exclusion of bony changes.

With regard to treatment, the general considerations have been already mentioned. The mucous or superficial type lends itself easily to aspiration or excision. One very important point is, that if tuberculous, whether deep or superficial, the excision must be thorough or a discharging wound will result. With the deeper or synovial type, there is considerable difference of opinion. For instance, Codman, who in 1906 first described the subacromial bursitis, then advocated excision but later inclined to conservative treatment, because the dissection is so difficult. Conservative steps are rest, massage, passive movement, and aspiration. After aspiration, some inject iodine. The chiropractors, at times, effect cures, where medical men are too conservative. For instance, in the chronic subacromial bursitis they often make a quick tremendous movement which either loosens up adhesions or has the same effect as the striking of a ganglion on the hand with a book. Bursae, of course, that are acutely infected with pyogenic organisms, must be incised to prevent extension to joints or the general circulation, and such chiropractic treatment, as just mentioned, might cause death. There are numerous instances where, no matter what causative factors other than trauma might be present, the obvious thing is immediate surgical correction of the bursa.

I will not discuss technique of various operations or report ordinary bursal conditions, but briefly will present two X-ray plates where the bony complications give rise to interesting problems.

Case A. J., age 55; male, farmer. Had not been able to sleep on right hip for 18 years. Gradually getting worse until now limps and cannot lift the leg. There was tenderness over the external aspect of the trochanter, pain on motion, and atrophy of the right buttock. Physical examination and laboratory tests otherwise negative. At operation, removed large dissecting bursa filled with rice bodies, the bursal walls being greatly thickened and microscopically showing inflammatory changes. Also curetted the bone. The problem is, which was first diseased, the bursa or the bone, and did one affect the other or (what is perhaps most likely) were both simultaneously affected by the same causation? According to Murphy, the classical picture of such trochanteric bursitis is always a slow advance, very rarely appearing as an acute metastatic infection following trauma. Swelling increases in size, until it extends half way down the hip. The only effective treatment is excision of the bursa.

Case F. G., age 51, janitor. Pain and tenderness of right heel, particularly over the tendo Achilles, just above its insertion into the os calcis. Has had a chronic general "rheumatism" over a period of twenty-five years, most likely due to an obstipation which he ignorantly does not watch. Had tonsillectomy two years ago, with partial relief as to the general rheumatism. Local condition in heel was of gradual onset, but had increased so that for two weeks patient had been unable to work. No special trauma known. Physical examination and laboratory tests otherwise negative. X-ray shows spicule of bone on os calcis near insertion of tendon Achilles. At operation the retrocalcaneal bursa was removed with no treatment of the spicule. In three weeks patient was back at work, X-ray still showing the spicule. In some cases where spicules of bone on the under surface of the os calcis have been removed, the symptoms have continued, indicating other causation—usually the bursa located between the plantar fascia and the bone. Such spurs have been found present in a considerable percentage of apparently normal feet. Blencke by X-ray found it in 2.8 per cent in an investigation of six hundred normal cases. The opinion is general that it is the bursitis which usually causes the pain and not the spur itself. I recently happened

in the operating room where an orthopedic surgeon was working on an elbow. The patient was a banker and had done considerable writing. He had removed a diseased portion of bone, doubtless tuberculous, but there was also a diseased olecranon bursa and he volunteered the information that the bursa had, undoubtedly, caused most of the symptoms.

Conclusions.

1. Chronic ailments, especially of the extremities, may be due to inflamed bursae.
2. While trauma was at first thought all important, increasing recognition has been given to the role of infections and other factors, as metabolic disturbances.
3. The synovial bursae especially are subject to the same diseases as joint membranes.
4. The X-ray at times shows calcium deposits suggesting bursitis but its chief value is in differential diagnosis.
5. Treatment depends at times, on response to removal of causations. Conservative surgical treatment is often sufficient, but, of course, pyogenic infection demands incision.
6. Where there are both diseased bursae and bone changes, the importance of the bursae are becoming more apparent.

DISCUSSION.

DR. EARLE R. HARE, Minneapolis: The subject of bursitis is of very great interest because oftentimes a diagnosis is not made and patients are allowed to suffer indefinitely when a cure might well be given them under proper treatment. The bursae in my experience that are involved most frequently are the subacromial, in the shoulder; the olecranon, in the elbow; the prepatellar, in the knee; and the bursa which lies just underneath the tendo-Achilles, above the heel. Other bursae are those concerned with the metatarso-phalangeal joint in the great toe.

The etiology is exceedingly interesting and is a bone of contention at the present time. As stated in the paper, there are those who believe that the etiology lies in trauma. For instance, a fall upon the point of the shoulder is not infrequently followed by a bursitis which develops almost immediately. The wall of the bursa will be thickened and inflamed. There will be limitation of the amount of fluid in the bursa, and then there will be agglutination or complete closure of the bursa by the inflammation of its walls. I can remember very distinctly in 1906 listening to Dr. Codman on bursitis of the shoulder, describing his method of treatment, which consisted in breaking up adhesions under anesthesia and placing

the extremity in such a position that the inflamed surfaces in that bursa would be removed one from the other. He abducted the arm at a right angle, flexed the elbow, abducted it further, and placed the hand behind the head on a triangle for an indefinite time, with very good success in many of these cases. But treatment has changed since that time.

There are those who maintain that the etiology lies in infection. I think, with our advancing knowledge of infection, it is very likely that the etiology lies more toward the side of infection than it does toward the side of traumatism, although by traumatism, we have a *locus minoris resistentiae* established, and infection supervening upon the trauma. The fact that one case in which the shoulder joint was involved has been examined by Brickner, of New York, who maintains that the etiology lies in trauma, and yet no organisms were found by him, does not prove the bursitis is not infective in its origin. Many of these cases are suppurative, and we know there is infection in the bursa. For instance, the prepatellar bursa is not infrequently involved in the suppurative process, as I have seen twenty-five cases of suppuration of the prepatellar bursa. I have seen an equal number, may be more, of suppuration of the olecranon bursa, and these bursae must ordinarily be either incised and completely opened and allowed to fill by granulation, or completely removed. If completely removed, ordinarily there is no further trouble.

Some years ago I removed a pair of prepatellar bursae that measured an inch and a half in diameter, and one inch in thickness, due to an old chronic infection in the bursa, with perfect result, even though there was active suppuration going on in one bursa at the time of its removal.

In making the diagnosis of this condition it is stated by Brickner, who has observed more than 100 cases of subacromial bursitis, that the thickened capsule itself will not show in the X-ray picture. I would be inclined to doubt that as a positive statement, for I think in some instances the thickened capsule will show as a shadow in the X-ray picture. If we have deposits of lime salts, there is no question about its showing, and the position of the bursa will be outlined by the X-ray.

This subject is receiving more and more attention, and like every other condition it demands careful and proper study, and proper treatment can only be applied when an accurate diagnosis has been made. If a proper diagnosis is made, many cases of neuritis and neuralgia, as described in the past, will disappear when proper treatment is instituted and the bursae are removed.

DR. ARNOLD SCHWYZER, St. Paul: I do not know that I have much to say on this subject except that when we have to operate on these cases, whether we have simply lime deposits to deal with, or whether they are infected, we want to remove the bursa as a whole. Simple incision of any suppurating bursa is exceedingly unsatisfactory.

The etiology of the condition requires attention. I remember very distinctly one case that came to me in which there was a fistulous condition of the prepatellar bursa. One could see from the star-shaped appearance of the surroundings that there was probably some specific infection. The Wassermann reaction was positive, and under antiluetic treatment the wound in this case healed promptly.

I recall another case in which a doctor made a diagnosis of tuberculosis of the shoulder joint. He operated, went away, and left the case in charge of his successor. This happened many years ago. The fistula remained and kept on discharging for months and months, and the successor, who had little information as to the operation, was kind enough to turn the case over to me. This case was not a case of tuberculosis of the shoulder joint. We incised the parts freely as we wanted to see where the fistula ran; we went underneath the deltoid, there encountered a sponge, and found that the joint had never been touched. The doctor had made a diagnosis of tuberculosis of the shoulder joint when it was only a subdeltoid bursitis. He must have encountered an exudate, which made him recognize the extra-articular condition.

DR. JOSEPH R. KUTH, Duluth: In the past six months I have seen six or seven of these cases, three of them involving the shoulder joint, one of them the hip joint. The impression received from these cases was that the trouble is undoubtedly the result of trauma. Whether trauma was the primary or sole cause I am unable to say. All of these cases were characterized by chronicity. The shoulder cases all showed lime deposits about the shoulder joint; two of them I took to be subacromial bursitis, and one of them subdeltoid bursitis. The impression conveyed here from what has been said, is that the lime deposits in these cases are generally found in the bursae. Brickner, of New York, demonstrated that the lime deposit is underneath the bursa. It is quite probable that a great many cases which we consider bursitides, are tendon injuries, with subsequent lime deposit infiltration. The bursa about the hip joint is located in the neighborhood of the great trochanter between the insertions of the glutei muscles, so that a hip with marked disability due to bursitis may be taken for the time being for tuberculosis, as in one case I recall.

An important point in the diagnosis of these cases of chronic bursitis, is limitation of motion in a certain group of muscles. I do not know whether that point has been brought out here today or not, but it is important. The pain is caused by certain motions.

The last two cases I saw occurred in young men who were enthusiastic automobilists and, it seems to me, that possibly the shifting of gears in these cases may have been a causal factor, as an oft-repeated, or continuous traumatism of the bursae about the shoulder joint.

Mr. Jones, of Liverpool, has treated many of these cases in the manner stated by the essayist with sat-

isfactory results. Mr. Jones has been doing this for a long time. He sometimes cures these cases by sudden stretching of the arm and breaking up of probable adhesions.

DR. H. B. SWEETSER, Minneapolis: Speaking about the diagnosis of bursitis, I have had an interesting experience. A woman had several sinuses discharging pus around the hip joint. She had had these for quite a long time, and a diagnosis had been made of tuberculosis of the hip by one practitioner, and I thought it was tuberculosis of the spine. X-ray examination showed nothing wrong with the hip. There was no interference with motion of the vertebrae, and the X-ray showed nothing there. We injected these sinuses with bismuth paste without any result, and then I operated upon her, and we found a focus of infection in the nature of a bursitis under the gluteus maximus muscle. This woman was sick for a long time prior to our diagnosis, but promptly recovered after the bursa was widely opened and the secreting membrane destroyed.

DR. M. S. HENDERSON, Rochester: Dr. Earl has touched on a point in his paper with reference to the irregular distribution of bursae. This is emphasized by the fact that our anatomical textbooks by no means mention all the bursae.

In his paper he mentions also a point that has not been emphasized in this discussion, but on which stress should be laid. In taking out a bursa, the bursa should not be incised and drained but the entire sac should be removed. The orthopedist sees a great many chronic cases of bursitis, and unfortunately in a large number of cases the patients come with a draining sinus the result of the bursal sac having been drained, infection certainly resulting, if not present before.

Quite recently I had my attention called to a bursa in an unusual situation. A large sac was found lying between the tibia and fibula in the upper third; it seemed to have a direct contact with the tibia and fibula. It contained a large amount of gelatinous fluid, approximately two teaspoonfuls. The sac was distinct except towards the muscle, there it thinned off to a membrane so delicate that it could not be traced. There is no reference to any such bursa in our textbooks.

In every prepatellar bursa removed in quite a number of years, we have sent the material to the bacteriologic laboratory for examination and culture. Only in clearly infected cases were we able to show any organisms. We are inclined to think, therefore, that many of these bursae, particularly prepatellar bursae, have as their etiologic factor purely a mechanical irritation.

TRAUMATIC ANOMALIES OF THE OCULAR LENS.*

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Traumatic anomalies of the lens may be divided into four classes:

1. Where the lens is rotated on its axis.
2. Where the lens is subluxated.
3. Where the lens is luxated.

(Each class may be accompanied by opacity of the lens).

4. Opacity of the lens, in situ, or with rotation, subluxation or luxation.

Anatomy.

At birth the lens lies in the anterior part of the eye, resting in the patellar fossa of the vitreous and in close contact with the hyaloid membrane. Its anterior capsule is laved by the aqueous humor. The inner marginal circular fibres of the iris support the lens in this position. The equatorial support comes from the delicate fibres of the zonule. The fibres run into the anterior and posterior capsule. In addition to its lens attachment, the zonule gives off a layer which runs between the ciliary processes to the posterior surface of the iris, to the ciliary bodies, and to the anterior portion of the retina. Held in such elastic surroundings the normal lens changes its curvature with variations of tension of its capsule and suspensory ligament, when the action of the ciliary muscle dictates.

In infancy the lens is more nearly round and is transparent; as the eye develops the epithelium of the anterior capsule sends out tiny fibres which run to the posterior pole. After attaching to the posterior pole, these fibres contract and their central portion is thus drawn near to the center of the lens. It is easy to see how, then, the action of many such fibres acting from both surfaces tends to compress the center of the lens into a nucleus.

This process goes on, and at the end of adolescence, instead of the transparent "drop of water" appearance, the lens shows a denser center and gives a straw yellow color. As life

*Read before the American Railway Surgeons' Association, Chicago, Ill. Oct. 18, 1917.

advances deeper layers of cortical fibres are formed, each adherent to the deep mass. The center of this mass becomes sclerosed (dehydrated) and a central transparent nucleus is formed.

The change in the index of refraction possible in the lens by accommodation is dependent on the change of the lens' structure above described. So beautifully concise is nature in her immutable law of age that the span of life already passed may be very correctly revealed by converting the possible accommodative diopters into years.

When age, disease, or trauma interferes with these changes going on in the lens, it loses its transparency and cataract results.

Etiology—Morbid Anatomy.

When the capsule of the lens is ruptured or punctured, the adjacent liquid is absorbed and consequent swelling results which separates the fibre layers and causes swelling and opacity. When the anterior capsule is torn the absorption is rapid; fibres of the lens may be seen in the anterior chamber if the opening is large. Indeed these particles of lens substance often clog the filtration angle and produce the dangerous condition of hypertension. The vitreous absorbs more slowly when the solution of continuity occurs in the posterior capsule. The process of evacuation of the lens substance from the capsule and absorption by the aqueous may go on until the entire lens is removed, the capsule remaining transparent, and an aphakic eye left. This, of course, is only possible when the patient is young (the lens being then more fluid in character), and the opening in the capsule so large that the edges retract. When the opening in the capsule is small, the epithelium of the capsule immediately sets about to repair it. When the rupture occurs under the iris near the pupillary edge, the iris instantly closes the wound and very little absorption of aqueous occurs. In this locality where a minimum of absorption takes place, the best recoveries are observed from traumatic cataract. When trauma produces a solution of continuity in the capsule and opacity of part of the lens occurs, it may remain stationary, may go on to complete cataract, or may resorb. The second termination is by far the most usual one, yet resorp-

tion of opacities does occur; an opacity of the lens is more likely to remain stationary the more solid the lens substance. Resorption is more liable to occur after adolescence up to the age of forty. The capsule forms no bar to vision after the lens is gone unless strenuous attempts at regeneration of the capsule have been made by the epithelial layer.

A rare form of traumatic cataract results from contusions of the eye, when there occurs a lenticular opacity resembling a miniature sun-dog, commensurate with the size and shape of the pupil. The opacities lie just beneath the anterior capsule and are probably caused by the aqueous slapping the pupillary edge of the iris against the capsule. Such cases clear up.

Opacities of the lens from chemical disturbance are not rare. When the composition of the aqueous is altered by poisonous substances, osmosis through the capsule results in injury to the capsular epithelium or the lens fibres; in either event cloudiness of the lens results. The change in the aqueous may come from within the body. The phenomena of life going on in the cells are chemical changes which are affected by alteration of the chemical composition of the liquids and tissues around them. Bacteria would be tolerated as any harmless particle but for the toxic substances they produce. These act as local irritants on the adjacent parts, and, through lymph and blood channels, on remote parts.

Opacities resulting from solution of continuity in the capsule start at the point of entrance of the foreign body and run in radiating lines or masses from this spot. Some resorption often occurs if the capsule heals readily, leaving only a round or nearly round opacity showing on the posterior pole; when in the posterior cortical region, the opacity appears irregular or star-shaped, lying just anterior to the posterior pole. The harmony of transparency between the posterior capsule and the lens is more easily disturbed than that which exists between the anterior capsule and the lens, because the epithelial layer exists only on the anterior capsule.

Posterior polar location of the cataract after trauma is more common in penetrating wounds because of the lever pressure of the lens posteriorly when foreign bodies enter the lens, and

especially is this true when they enter the center of the lens anteriorly. Around most opacities fog-like areas appear. Opacities resulting from penetration generally increase until the whole lens is cataractous. Often in advanced life the liquid portion of the lens is absorbed and the nucleus dries up remaining in the capsule a shrivelled mass. Large star-shaped cataracts result when the cortex is disturbed directly,—opacities radiating from the nucleus.

Concussion and contusion cataracts occur when no rupture of the capsule is present. They are due to the effect of the vibration on the epithelial layer of the capsule. Slight tapping on the closed lid has caused cataract. Concussion cataracts generally occur soon after the trauma; they may develop long after the injury and as a result of the violence.

Any interference with the excretion of the fluids of the lens that causes a dropsy, by pushing the fibres apart, causes cataract.

Chemical changes from the ultraviolet rays give an interesting study. The lens absorbs, or at least transforms much ultraviolet light; it is not difficult to see why the lens should be injured by rays of this sort. As we rise in altitude the air becomes richer in ultraviolet rays, hence one sun-burns much more readily in high altitudes. Injuries from the ultraviolet rays of intense lights give rise to cataracts known as "occupational cataracts" from light, or heat and light trauma. Typical of this class is the glass-blowers' cataract. Thirty per cent of individuals following this occupation have cataract in the left eye before the age of forty (this being the eye nearer the light of a right-handed worker). The candle light is weakest in ultraviolet rays, next the oil lamp, then the gas light, and strongest of all the electric light; the more efficiency the electric light has, compared to the strength of the current used, the greater the strength of the ultraviolet ray and consequent danger.

Subjective Symptoms.

The disturbances of vision depend on the character as well as the location of the opacity. A small amount of opacity, evenly spread, gives poorer vision than a much more opaque substance arranged in lines or bars. Breathe on a cold glass and you may obscure your vision

of the outer world, while you see perfectly through heavily barred windows.

Central opacities falling directly in the line of vision, though small, may greatly interfere with it; the same opacities behind the iris would not influence vision in the least unless they produced some lenticular refractive anomaly. *Muscae volitantes* arising from cataract, change their position with, and only with, the movements of the eye-ball—a valuable diagnostic point. Polyopia monocularis is nearly always a result of lenticular astigmatism produced by a distortion of contour of the lens. This distortion is, in severe cases, sufficient to give several images. When opacities are situated in the center of the lens, the patient sees poorly or not at all in bright illumination. This is due to the effect of the light on the pupil, making it very small. These people see relatively much better in subdued illumination, because the pupil dilates so that it is larger than the central opacity. Such people are said to have "night sight" (hemeralopia). It is in these cases that the charlatan, with atropine, temporarily produces so much of a cure by the "no knife" method that he is able to extort large sums of money;—exit mydriatic, exit cure. When the opacities are peripheral the reverse of the foregoing is often true. The sight is better under strong illumination where the pupil is small and the peripheral rays are cut off by the iris. This is called "day sight" (nyctalopia). A myotic gives temporary benefit in these cases. As the power to distinguish objects fails, so-called qualitative vision is lost, but light perception—quantitative vision—is always maintained over the entire fundus if the fundus be normal.

Objective Symptoms.

To detect opacities of the lens, lateral illumination and the ophthalmoscope are often required; if opacities be peripheral a mydriatic must be added. With focal illumination by use of reflected light the opacities of the lens show as whitish spots or striations. They appear sharper of outline and whiter the more anteriorly they are situated; the outline becomes less defined and the color more grayish the farther back they are placed. The opacities in any situation appear black against the dark red back-

ground when viewed with the ophthalmoscope. In traumatic cataract it is often possible to see the point of opening in the capsule and some lenticular particles in the anterior chamber. Sometimes, indeed, the anterior chamber is filled with lens substance.

Differential Diagnosis.

The differential diagnosis of traumatic cataract from that resulting from disease and age (senile cataract) becomes at once a study of greatest interest to the corporation surgeon in order that he may fend off that fraudulent combination of men, ever ready by any line of deception to defraud any corporation.

First and foremost, in differential diagnosis of traumatic cataract we look for the point of penetration or rupture of the capsule of the lens. Failing in this, it becomes our duty to look most carefully for those conditions present in the individual which might naturally result in a cataractous lens without injury. In differentiating traumatic cataract we must not forget that disease plays an important role in the production of cataract. Under this head diabetes mellitus comes easily first. Diabetic cataracts are always bilateral. Senile cataract itself is not a physiological process as is gray hair, but comes from some faulty metabolism consequent on age. The plethoric and gouty often escape, after incipient cataract starts, by alkaline cures with diet and exercise. Prolonged exposure to bright light acts to change the lens, especially where the aqueous is rich in mineral salts of calcium and magnesium. The glare of the desert sands is a cause of cataract.

Diseases which suddenly abstract the liquids from the system are followed by lenticular opacities; for example, cholera. Lamellar cataracts occur in the young after convulsions and rickets.

Congenital cataracts occur from intra-uterine disturbances of development, or from inflammation. These are generally bilateral and heredity plays an important role, as indeed it does in senile cataract.

Among eye diseases complicated with cataract are glaucoma, excessive myopia, ulcus serpens and the violent inflammations of the anterior part of the eye, retinitis pigmentosa,

choroiditis, especially irido-choroiditis chronica, and irido-cyclitis. In the last named disease, changes may have gone on in the eye for some time, the cataractous eye being of lighter color.

If the two eyes of an individual are of different color (heterochromia iridis) and a cataract develops in one of them, it will always be found in the lighter eye. This must always be connected with the lack of pigment in the lighter eye, and some disturbance of nutrition will always be found as the etiological factor of both conditions. In the lighter colored eye one may nearly always find minute deposits from a chronic cyclitis. Nearly all children are born with a deep blue iris. Little pigment is then found in the very thin stroma and the posterior blue pigment layer shows through. The stroma thickens with age, and if the pigmentation does not increase the eye simply shows as blue or gray. When corresponding increase of pigment occurs as the stroma thickens, the iris takes on a darker color. The dark pigmentation sometimes occurs in patches giving the blue-brown mottled iris. The pigmentation of the healthy iris invariably is in proportion to the general pigmentation. The dark races have dark irides. The pigment in the branched cells of the stroma does not always develop equally with the stroma and sometimes not at all, but the epithelial pigment is present. It is found in the retinal layer of the iris. In albinos pigment is absent from the retinal layer as from the stroma. Numerous vessels abound in the translucent greyish-red iris.

Certain characteristics of cataracts point to their cause. Thus in choroiditis and retinitis pigmentosa, anterior and posterior cortical cataracts are found; they are generally stellate in shape, and, if the cataract be total, the capsule appears very thick and the lens may be either liquefied or calcified. They are often greenish or greenish-yellow in color, and often in these cases the iridodonesis points to a lesion in the zonule. If there is no visible evidence that the cataract is a complicated one, it still may be produced by other diseases and we must not overlook the test for light perception in every case, as such test will often show the perception of light to be deficient or altogether wanting. Cataracts occurring in the lighter eye of

an individual, as we have already seen, come under the head of *cataracta complicata*. The difference in the color of the two eyes may be very little and yet the lighter eye may show pronounced degenerative changes, extending over many years before the difference in the irides is detected.

Altered composition of the nutrient fluids causes cataract, as diseases of the thyroid and parathyroid glands. Ergotism and raphania may cause cataract; cataract often accompanies uncinariasis from malnutrition. Naphthol used too long and freely from skin diseases often causes cataract. Lightning and electricity produce cataract by bringing about chemical changes in the fluids of the eye and not by burning, as are the lesions produced on the external surface by these agencies.

Occupations requiring the handling of poisons are justly suspicious. In the hands of a tyro, some normal conditions have been mistaken for starting traumatic cataract, as, for instance, the normal stella observed with oblique illumination and the use of a magnifying glass. The sectors look gray and the intersectorial divisions appear as dark lines.

Ectopia Lentis.

In the normal eye the pupil is seldom exactly central. It is usually a little below and to the inner side of the center of the eye-ball. When congenital dislocation of the lens occurs the pupil is generally considerably dislocated (ectopia pupillae), and the dislocation is generally upward or outward. When the dislocation is congenital the retinal pigment epithelium forming the posterior layer of the iris is often pulled and turned over the edge of the iris forming a dark ring at the edge of the pupil; sometimes this layer laps over the anterior surface of the iris sufficiently to form a dark, patched appearance, running in the direction of the luxation. A wavy appearance of the iris may be found in the quadrant where the luxation occurred, if the iris is carefully inspected with a strong magnifying glass. These points often enable the surgeon to state that luxations occurred before birth and are not the result of trauma during life.

Congenital luxations are always bilateral. They are frequently apparent in several mem-

bers of the same family, and often occur in conjunction with other congenital anomalies, as extreme refractive error, deficiencies of development, microphthalmus and the like. Such eyes are more subject than normal eyes to various diseases, as chronic inflammations of the uveal tract, and glaucoma.

Treatment.

The aqueous that is secreted by the iris can find exit by way of the ligamentum pectinatum. Not so the aqueous secreted by the ciliary body. It must first pass through the pupil, and when there is seclusion of the pupil from any cause the aqueous of ciliary secretion is dammed back; this pushes the iris forward and, if extreme, against the periphery of the cornea. The ligamentum pectinatum is now pressed on and escape of the aqueous is rendered impossible. Lens substance in the anterior chamber sometimes blocks evacuation by way of the ligamentum pectinatum, hence it follows that increased tension is often a serious condition arising in traumatic cataract. It may be fatal to sight unless procedure against it is instituted. These operations are three and they are effective, namely, removal of the lens, iridectomy, and paracentesis of the cornea.

Each method is equally effective when applied to suitable cases. Paracentesis is beneficial in two ways. It evacuates part of the contents of the eye-ball that is suffering from a high tension. The anterior chamber refills to normal in amount in five to sixty minutes, but the new aqueous is a different aqueous. It contains more albumin and fibrin and protective bodies which are always present in the body in increased numbers in disease or injury, and which are not imparted to the aqueous of natural secretion. This explains why paracentesis acts so favorably in many diseased conditions. The eye-ball has no lymph vessels and excretion must go on through lymph spaces and passages in the ligamentum pectinatum and the perichoroidal spaces in which lie the lax lamellae and the lamina suprachoroidea. These communicate with Tenon's space, whence we follow through the supravaginal space to the outer side of the dural space and on by the intervaginal space between the sheaths of the optic nerve. Again, a space which corresponds

to the hyaloid or central canal of the vitreous, running directly back to the optic nerve, is present. The posterior spaces carry only a small amount of fluid to the eye and when compressed do not contribute much to increased tension, causing rather irritation of the papilla.

When seen early the first procedure in the treatment of traumatic cataract is to combat inflammation. Ice compresses act well to subdue this and also prevent great swelling of the lens. When the swelling of the latter is great—so great as in itself to be the cause of great reaction—removal may be done at once. It is better where possible to wait, as often a large part of the lens is later absorbed and the simpler operation of decision can be performed. Medicinal treatment depends on the age of the patient and the extent of the injury to the lens and other tissues of the eye. Atropine in 1 per cent solution is useful for installation when indicated. Dionine probably hastens the absorption of the lens substance from the anterior chamber and may save one from doing an iridectomy in some cases. Irrigation with normal saline or 1/10,000 formaline solution is beneficial, as also is the use of germicidal ointments.

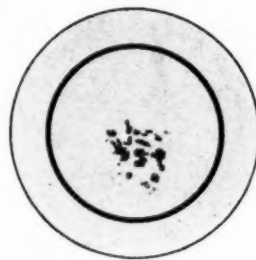
Atropine is especially indicated in those cases where it is reasonable to expect iritis, or the formation of synechia between the iris and the lens, and fear of tension from its use should not prevent its application in such cases. Tension is relieved, surgically, very easily and safely.

The operation of iridectomy becomes useful where the filtration from the anterior chamber is interfered with and remains very useful for later extraction; it is also indicated where synechia, anterior or posterior, would result without it. Operation on the lens for cosmetic reasons should always be delayed until all inflammatory symptoms have subsided.

Paracentesis becomes of great value when the tension is high and there is no danger of iridial synechia, and where it is especially dangerous to extract the lens on account of infection already present.

Those cases caused by the injury to the epithelial layer where small opacities occur often clear up under eserine, cold and rest. Below is annexed cut of a lens from the eye of a patient, a division superintendent, showing opaci-

ties present six days after trauma; six days after injury, $V = \frac{50}{70}$; thirty days after injury $V = \frac{50}{20}$, lens perfectly clear.



Lens Perfectly Clear.

With subluxation of the lens, its edge appears black by transmitted light with the ophthalmoscope, because the light reflected from the fundus is so strongly deflected by the lens that it fails to reach the eye of the observer, if he is directly in front of the patient's eye. If the observer move his eye to the opposite side of the lens to where the rays pass that are transmitted through this edge, the latter appear a shining red and the rest of the lens glows, if it be transparent. When sufficient violence is encountered to loosen or rupture the suspensory ligament, each excursion of the eye causes an oscillating movement of the iris (iridodonesis). When concurrent with this the lens becomes decentered, subluxated, or luxated, or so rotates on its axis as to produce displaced, distorted, or doubled images, the patient consults the surgeon; otherwise the objective symptom of oscillation of the iris may be the only one. Rupture of the zonule may occur congenitally.

Luxation may occur into the anterior chamber; but is far more common into the vitreous. Luxated lenses always become cataractous in time. While the luxated lens remains transparent it is faintly grey by reflected light and shows luminous edges; by transmitted light with the ophthalmoscope its edge appears black. When the lens luxates into the anterior chamber the irritation generally produces spasm of the sphincter iridis and reduction is impossible. Cases occur where the lens is caught in the pupil after rupture of its attachments by the spasm of the sphincter. Generally, when the lens luxates into the aqueous it

sets up enough inflammation to form exudative attachments and becomes fixed. Rare cases occur where a small luxated lens passes in and out through the pupil, the lens passing in and behind the iris when the patient lies down, and coming out in the anterior chamber in front of the iris when the patient bends the head forward. These cases give easy extraction. After manipulation to get the lens into the anterior chamber, a myotic (eserine) is used to close the pupillary exit door and extraction is easily accomplished. When posterior luxation occurs the lens generally becomes fixed in some position. However, occasionally it is seen floating around in the vitreous. Subluxations pull on the zonule, causing atrophy and become luxations. The latter always become serious, generally by way of secondary glaucoma or iridocyclitis. Anterior luxations are by far more dangerous to the integrity of the eye-ball. Luxation occurs from disease as well as from trauma, as excessive myopia, choroiditis, detachment of the retina, or any diseased condition that produces atrophy of the zonule. After zonular atrophy a cough or a sneeze may produce the luxation, or even the act of bending over after a full meal. Tumors, exudates in the vitreous that subsequently contract, staphylococci of the cornea or sclera may produce luxation.

When glaucoma or iridocyclitis threatens, extraction is indicated in traumatic cataracts, luxated or in situ, provided that the contraindication of acute infection is not present.

When there is luxation and the zonula is already ruptured, prolapse of the vitreous causes unusual difficulty in extraction. Removal of the lens from the vitreous may be made, first using atropine and a wide iridectomy. A condensing light is placed above and to one side of the eye so that the lens is clearly seen in the vitreous. A spoon is used if the lens is low, or a hook if high. When the vitreous is not fluid, gentle pressure on the lower lid made toward the center of the eye often delivers the lens.

For secondary chronic inflammations following cataract, iridectomy may be resorted to; it is not always beneficial. If the eye be already blind, or tender or painful, an enucleation should be done for comfort and safety.

Operative and post-operative technic is so

generally discussed in every text book, and every surgeon so strongly opinionated on the subject, that it is not considered necessary to dwell thereon.

SARCOMA OF THE LUNG.

REPORT OF A CASE.

H. LONGSTREET TAYLOR, M. D.,
St. Paul, Minn.

AND

CHAS. E. CAINE, M. D.,
Morris, Minn.

M. L., female, aged 11 years, was first seen by the authors in consultation, October 23, 1917.

Family history negative regarding tuberculosis or cancer.

Personal History: Child had had measles, chickenpox, whooping cough and mumps. None of these attacks had been at all severe and they were all followed by rapid and satisfactory convalescence. She had never suffered with repeated or prolonged attacks of bronchitis. She had attended school until the middle of September, 1917, although she was not quite up to the mark in August.

At the first consultation Dr. Caine supplied the following notes: "She has been in poor health for four weeks following an operation for tonsils. The right chest was as it is at present. Temperature was 102° but soon subsided and she has had but an occasional rise since, and none lately. There has been but little cough. Once in a while she has had a hard paroxysmal cough, such as might come from pressure. No emaciation; no sputum. On examination the first thought was pleurisy with effusion or empyema. Aspiration with different sized needles yielded nothing."

Notes of first examination: Fairly well nourished child; no expectoration; no night sweats; voice natural; appetite fair, but complains of abdominal discomfort after eating; bowels regular, sleep good; temperature normal; heart action very rapid; urine, specific gravity 1030, urates in excess. Inspection:

Right side of chest more prominent than left, superficial veins dilated and extending from lower edge of ribs to clavide; inter-costal spaces tense and bulging. Absolute flatness on percussion from second rib to pelvis on right side, and across front of chest to left border of sternum. Splenic dullness greatly enlarged. Heart displaced to the left; apex beat in left axillary region. Respiratory murmur normal over left lung, absent over greater part of right lung except at apex and along border of sternum, where there is a loud bronchial rhonchus. Heart action very rapid with loud bruit with the second sound.

Fluoroscopic examination showed clear lung tissue to second rib with everything obscured as low as the pelvis. Heart large and displaced to the left to an extreme degree. Left lung, medium border displaced to the left, otherwise normal. In a letter to Dr. Caine, October 26, a tentative diagnosis of a rapidly growing sarcoma in the right chest was made. Within 10 days the circumference of the chest had increased one inch in measurement. The patient failed rapidly. Morphine had to be used to allay pain and sleeplessness. She died November 27th.

Post-mortem Examination: Abdominal organs normal; right side of diaphragm was pushed down into the abdominal cavity as far as the umbilicus. The liver was dislocated to the left side. The mediastinum and its contents were found entirely to the left of the sternum. The heart was well over in the axillary region. The right side of the heart was tremendously dilated and extended beyond the left side forming the apex. The walls of the right ventricle were very thin. The tricuspid valve was insufficient. The left lung was normal except where it had been collapsed from pressure along its median edge. The distended right pleura contained a broken down shapeless mass of the consistency of mush. The hand carefully introduced to bring out the right lung simply passed through it without resistance. The substance had no resemblance to normal lung tissue.

Report of the Pathological Examination. On November 28th, Dr. H. L. Taylor brought a tissue mass to this laboratory for histological examination. The tissue submitted weighed about five hundred grammes. Upon microscopic examination it was found to be very soft and friable. There was no capsule present and the mass submitted had the appearance of being only a portion of the entire growth. Upon cut section the mass was found to be exceedingly soft and in areas it showed a red and gray mottled appearance. The growth was hardened in 20% formalin to facilitate examination. After this treatment for seventy-two hours, it was again examined. This time the mottled appearance was more pronounced but no definite connective tissue structure could be determined microscopically.

From stained section of this material, however, we have demonstrated a sarcoma, probably of the round cell type. The tumor is composed of many small round cells held in a most delicate vascular stroma. There are also present many larger cells which are probably foreign body cells. In this neoplasm, as in many other forms of sarcoma, there appears to be a local necrosis of tumor cells from lack of sufficient blood supply. This leads to a peculiar condition in which only those cells close to the blood vessels are alive and the rest fade into a pale staining debris. Many mitotic figures are present in this specimen in all stages of development and we are therefore led to believe that the tumor is one of a very rapidly growing type.

Beebe Laboratories,

By H. H. Warner.

Pathologist.

A case similar in many respects was reported by Rolleston and Trevor, *British Medical Journal*, Feb. 14, 1903, in a child 13 years old. They describe the tumor as follows: "Whole right lung except apex converted into soft gruel like growth with hemorrhagic areas. Microscopic diagnosis: Spindle celled sarcoma."

TONSILLECTOMY IN ARTHRITIS.

EDMUND L. WARREN, M. D.

St. Paul, Minn.

Infectious arthritis in any of its varied forms constitutes one of the most definite indications for tonsillectomy. We cannot, however, by inspection alone, accuse a pair of tonsils of being the seat of the infection. The previous history is important as to the number and severity of attacks of tonsillitis or quinsy, and whether or not there has been "rheumatism" in either its acute articular or any of the numerous phases of the so-called "rheumatic diathesis." The size of a tonsil is no criterion of its pathologic condition. As a general rule, however, the large tonsils, with wide-open crypts having their oral surface free from contact with the plica and pillars, seem to be "self-evacuating," due to the compression and massage they receive during the act of swallowing. The experience of the writer has been that inspection of tonsils in situ in persons with previous or existing "rheumatism," shows them to be either the small buried type or the large flat tonsil which some years previously has been subjected to an operation which did no more than amputate the visible portion. These tonsils should have been left as they were, in lieu of the performance of a complete enucleation.

Given a case showing chronic or sub-acute "rheumatism" we are at once confronted with the question, "shall we operate, and if so, how soon?" There seems to be no question that an operation is indicated, provided, of course, that other sources of infection have been eliminated. The urgency of operation in these cases, it seems to the writer is just as great as is the need for removal of a tooth with an apical abscess draining into the system. If we feel certain that the tonsils are constantly adding to the blood stream toxins which cause and keep up the symptoms, the sooner these storehouses are removed the better for the individual. In a patient having had just previously, or at the time of operation, one or two joints which are stiff, somewhat reddened, or even showing slight swelling, there almost invariably occurs during the first week or ten days following the operation an aggravation of the joint symptoms. This undoubtedly is due to some absorp-

tion from the raw surfaces of the tonsillar fossae. With the pathogenic bacteria which are present in the mouth it is natural to suppose that the fossae would not remain clean. The fossae are the seat of a superficial coagulation necrosis in which are bacteria and their toxins, leucocytes, fibrin, epithelial debris and food particles on a raw surface, through which there is bound to be some absorption. These areas are not evidence of an infectious invasion of the living tissue but merely a superficial necrosis of the leucocytic and fibrinous exudation. Tissue infection is probably prevented by the wide-open nature of the wound and the fact that the surface is being constantly washed by the saliva.

Quite frequently, however, a mild degree of infection of the tonsillar wound follows the operative attack on this region, but it is significant to note that comparatively few severe infections occur. A certain number of operated cases show a moderate degree of temperature elevation for two or three days following the operation and accompanied by increased sore throat, general malaise and other indications of a mild degree of sepsis. The appearance of the wound in these cases seldom differs from those running a normal temperature, except that the surrounding tissues are somewhat more reddened and there is generally some edema of the uvula.

About the time this necrotic membrane disappears, due to replacement by epithelium growing in from the edges of the wound and scar tissue replacing the granulations in the center, the rheumatic symptoms begin to subside. In the great majority of cases the wound is free from this membrane in from twelve to fourteen days. It is from this time on that we look for the beneficial results of the operation, and those who look for them before this time will be disappointed.

Aside from very favorable effects upon the joint symptoms, a pre-existing endocarditis is frequently seen to be decidedly improved. In a case obviously having septic vegetations on the heart valves and a definite history of tonsil trouble, we are occasionally called upon to operate with the idea of doing all that offers any prospect of relief and at the same time take the added risk of spreading the infection. In

a recent case of this sort operation seemed advisable to all who saw her. Following the operation the throat healed completely in less than the average time. At the end of the two weeks the joint symptoms had cleared up but the temperature was running from 99° to 102° or 103° . Twenty days after the operation the leucocytes were 16,000, streptococci were in the bloodstream, her neck was stiff, and the whole left side was paralyzed due to embolism of the right

internal capsule of the brain. At the end of another week the temperature indicated a most profound sepsis and twice each day went to 105° or 106° and then dropped to 96° or 97° . Death occurred on the thirty-eighth day after removal of her tonsils. Grossly, the tonsils showed numerous closed crypts each containing caseous material. These tonsils had been "clipped" some years previously and on inspection appeared flat and rather small.



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EDITORIAL AND BUSINESS OFFICES

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Vol. I April, 1918 No. 4

EDITORIAL

MINNEAPOLIS CLINICAL WEEK.

The attention of our readers is called to the tentative program for the "Minneapolis Clinical Week" which is published in this issue. The completed program will be issued on the first day of the meeting which is Monday, April 8th, and will be supplemented each day with more detailed and definite information. Every effort is being made to see that visiting physicians will be properly placed in the work which they most desire to see.

There are ample clinical facilities for a large number of men. There are 2,200 beds in the Minneapolis hospitals and in addition there are large dispensaries at the University and Minneapolis City Hospital.

The clinics will be given under the auspices of the Clinical Section of the Hennepin County Medical Society. It is in no sense a "Surgical Congress," for clinics of all kinds in all the different specialities will be given.

The work will be so arranged that no more men will be allowed in a clinic than can be accommodated. There will be some special features.

On Monday night the Hennepin County Medical Society will hold its annual banquet to which all visiting men are invited.

On Wednesday evening the Minnesota Academy of Ophthalmology and Oto-Laryngology will have its annual meeting at which Dr. Louis Fisher, of Philadelphia, will give an address.

There will be a scientific meeting Wednesday which will be addressed by some celebrity to be announced later.

Dr. Major E. Seelig, M. R. C., of St. Louis, will be at the meeting and will talk on some of the surgical war problems.

Dr. William G. Sharpe, of New York, will give some report of the work he has been doing in brain and cord surgery.

The Registration Bureau will be in the lobby of the Hotel Radisson and all necessary information may be secured there.

It is very important that those who expect to attend should secure hotel accommodations early as there is to be a State Republican Convention held in Minneapolis on Monday, April 8th.

Do not forget that the Minneapolis Clinical Week begins Monday morning, April 8th, and ends Friday evening, April 12th.

Remember everything possible will be done to make visitors comfortable and happy and give them something worth while in clinical work.

JOIN THE MEDICAL RESERVE CORPS.

At the annual meeting of the Minnesota State Medical Association held in St. Paul, October 11 and 12, Major J. F. Corbett, recently of Minneapolis, now in active service, brought out some very salient facts regarding the needs of the Medical Reserve Corps of the U. S. Army. We take great pleasure in having Major Corbett present the important features of the situation:

"Some six years ago the Medical Reserve Corps was organized. This never had a very large membership, because the need for an organization was not very apparent. A year ago last June the Medical Reserve Corps was reorganized, to become a branch of the Officers' Reserve. Then our threatened war became apparent, and interest was at once stimulated in the medical branch of the Officers' Reserve Corps. It became very apparent that a great deal of work had to be done if the enormous army that this country was to raise should be supplied with medical men.

"With this purpose in view, various examining boards were appointed throughout the country to obtain officers for the Medical Reserve. Various agencies, the National Council of Defense, various state agencies, and various individuals, stimulated the interest in them, and as a result, all over the country nearly enough men have come forward to supply immediate needs.

"But that does not mean that anyone should hesitate to offer his services. If we have men enough for today—barely enough to supply the needed men in the reserves for today—it means we are going to need a great many more men than this a year from now; and it is very much better to take time in the selection of these men, and in getting them classified and properly placed, than to rush the work the way we have had to do during the last three or four months.

"Therefore I do not want the impression to go out that the army has enough reserve men. It is true that they have enough for the immediate present, but let us build this thing up on the big scale upon which it ought to be built. Let every available man offer his service to the country, so that when the crisis becomes acute it will be known where the right man is for the right job, and round pegs will not be fitted in square holes.

"For two million men we need actually twenty thousand medical men. That, figured on the number of physicians in the United States, means one man out of every seven, or of actually practicing men of military age, one man out of every four. Minnesota has 2,447 practitioners. Only 1,498 of these are sufficiently active in their profession to belong to the State Medical Society. Minnesota to hold up its head

will have to furnish 350 medical reserve officers. That is for the present army. To make this thing an ultimate success we will have to furnish more than that.

"Now, what has been done? The Board of which I am a member has so far recommended for commissions 348 men. I have tried to follow these by questionnaires, and I have only evidence of 227 that have actually accepted their commissions; so that we can only at the present time actually count on 227, although there are about 100 men that have been recommended so recently that they have not had time to accept their commissions.

"These men are from a number of states. From Minnesota alone, our Board has recommended for commissions 259 men, and 177 of these have accepted their commissions. Nine have refused their commissions. We have rejected in Minnesota 33 men.

"That means that this work, to my mind, should go on. We must keep on. We are really only about half through with what should be done to make the Medical Reserve Corps such a success that it will fill any possible emergency that may arise. And I am going to again ask the co-operation of every member of this Society, not only in offering himself, but his co-operation in enlisting the interest of other men. It is particularly the young man that the army needs for certain kinds of service, but every type of man is needed, because every type of medical service is represented in some way in the army."

IMPORTANT.

Owing to the great demand for the January and February issues of *Minnesota Medicine*, readers of the Journal who are not keeping these two numbers for binding are asked to kindly send them in to the Editorial offices.

MINNEAPOLIS CLINICAL WEEK.

PRELIMINARY PROGRAM.

April 8, 9, 10, 11, and 12.

A more complete program, which is now being compiled, will be issued later. A daily bulletin, issued every afternoon, will give in detail the program for the following day.

SURGERY.

City Hospital

SURGICAL CLINICS—Daily

Dr. Arthur T. Mann, Dr. Henry C. Stuhr, Dr. F. H. Poppe, Dr. F. L. Adair, Dr. J. H. Simons, Dr. F. R. Wright, Dr. A. H. Parks and Staff, Dr. H. B. Sweetser and Staff, Dr. A. E. Booth, Dr. Edward Moren.

University Hospital

DIAGNOSTIC, EMERGENCY, AND SURGICAL CLINICS—

Dr. Franklin Wright, Dr. J. E. Moore, Dr. Arthur Strachauer, Dr. James A. Johnson.

St. Barnabas Hospital

SURGICAL CLINICS—

Dr. F. A. Dunsmore, Daily, Dr. E. R. Hare, Dr. R. E. Farr, Daily, Dr. H. J. Franzen, Dr. A. A. Laurent, Dr. A. E. Booth, Dr. R. J. Phelan, Dr. S. C. Schmitt, Dr. A. E. Benjamin, Dr. W. H. Aurand.

Northwestern Hospital

SURGICAL CLINICS—

Dr. Gustav Schwyzer, Dr. A. E. Benjamin, Dr. A. T. Mann, Dr. C. Nootnagel, Dr. Oscar Owre, Dr. Herman Bouman, Dr. O. W. Yoerg, Dr. H. W. Jones.

Swedish Hospital

SURGICAL CLINICS—Daily

Dr. C. J. Ringell, Dr. Oscar Owre, Dr. C. M. Kistler, Dr. A. E. Johnson, Dr. Edward Moren, Dr. Theodore Tennyson, Dr. John Rishmiller.

Hillcrest Hospital

SURGICAL CLINICS—Daily

Dr. J. W. Little, Dr. C. G. Weston, Dr. E. K. Greene, Dr. A. S. Fleming.

Fairview Hospital

SURGICAL CLINICS—

Dr. Ivar Sivertson, Daily, Dr. H. N. Sheldrup, Daily, Dr. Iden, U. S. N., Some Phases of Naval Surgery.

Asbury Hospital

SURGICAL CLINICS—

Dr. Arch A. Wilcox, Daily, Dr. A. H. Parks, Dr. E. Z. Wanous.

Eitel Hospital

SURGICAL CLINICS—Daily

Dr. G. G. Eitel, Dr. E. C. Robitshek.

Abbott Hospital

SURGICAL CLINICS—

Dr. A. W. Abbott, Daily, Dr. A. C. Strachauer, Dr. Stephen Baxter.

Norwegian Hospital

SURGICAL CLINICS—

Dr. E. L. Paulson, Dr. A. G. Wethall, Dr. C. M. Roan, Dr. Nimrod Johnson.

St. Mary's Hospital

SURGICAL CLINICS—

Dr. H. B. Sweetser, Daily, Dr. W. J. Burns, Daily, Dr. C. E. Henry, Dr. M. J. Lynch, Dr. Nimrod Johnson, Dr. E. O. Voyer, Daily.

St. Andrew's Hospital

SURGICAL CLINICS—Daily

Dr. C. Nootnagel, Dr. H. A. Bouman, Dr. Hugo Hartig, Dr. F. L. Adair.

OBSTETRICS AND GYNECOLOGY.

City Hospital

OBSTETRICAL CLINICS—

Dr. F. L. Adair and Staff, Dr. J. H. Simons, Dr. H. B. Sweetser and Staff.

GYNECOLOGICAL CLINICS—

Dr. H. B. Sweetser, Dr. J. H. Simons, Dr. C. O. Maland, Dr. F. J. Souba.

University Hospital

OPERATIVE GYNECOLOGY—

Dr. W. H. Condit, Dr. J. C. Litzenberg, Dr. J. L. Rothrock.

MANIKIN DEMONSTRATION, USE OF FORCEPS—

Dr. J. C. Litzenberg.

GYNECOLOGICAL DIAGNOSIS—

Dr. L. W. Barry, Dr. J. W. Bell, Dr. W. H. Condit.

BEDSIDE CLINICS—

Dr. J. C. Litzenberg, Dr. W. H. Condit.

EYE, EAR, NOSE, AND THROAT.

City Hospital

DIAGNOSTIC CLINICS—

Dr. J. D. Lewis, Dr. S. E. Kerrick, Dr. J. T. Litchfield.

SURGICAL CLINICS—

Dr. J. D. Lewis, Dr. J. S. Reynolds, Dr. S. E. Kerrick, Dr. J. T. Litchfield.

University Hospital

DIAGNOSTIC CLINICS—

Dr. J. S. Macnie, Dr. G. E. Strout, Dr. Horace Newhart, Drs. F. J. and J. A. Pratt, Dr. W. E. Patterson.

SURGICAL CLINICS—

Dr. W. R. Murray, Dr. H. S. Clark.

REFRACTION CLINIC—

Dr. E. A. Loomis.

Examination of aviation recruits will probably be given during the week at Millard Hall.

Northwestern Hospital

SURGICAL CLINICS—

Dr. E. S. Strout, Dr. Douglas Wood, Dr. Horace Newhart.

St. Barnabas Hospital

SURGICAL CLINICS—

Dr. H. McI. Morton, Dr. W. R. Murray, Dr. J. S. Reynolds, Dr. G. L. Doxey.

Asbury Hospital

SURGICAL CLINICS—

Dr. J. A. Watson, Dr. M. R. Wilcox, Dr. H. H. Leavitt.

Eitel Hospital

SURGICAL CLINICS—

Dr. C. N. Spratt, Dr. Justus Matthews, Dr. G. A. Kohler.

Swedish Hospital

SURGICAL CLINICS—

Dr. E. H. Parker, Dr. Douglas Wood, Dr. J. G. Ericson.

Hillcrest Hospital

SURGICAL CLINICS—

Dr. F. C. Todd, Dr. W. E. Patterson.

Abbott Hospital

SURGICAL CLINICS—

Dr. R. A. Campbell.

St. Mary's Hospital

SURGICAL CLINICS—

Dr. C. D'a Wright, Dr. G. E. Benson.

INTERNAL MEDICINE.

City Hospital

BEDSIDE CLINICS—

Dr. H. L. Ulrich, Dr. E. L. Gardner, Dr. J. G. Cross, Dr. H. L. Staples, Dr. John Hynes, Dr. T. A. Peppard, Dr. C. N. Brooks.

CLINIC ROOM—

Dr. H. L. Ulrich, Dr. J. G. Cross.

University Hospital

BEDSIDE CLINICS—

CARDIAC DISEASES, DIABETES, AND RENAL DISEASES.

Dr. L. G. Rowntree, Dr. H. L. Ulrich, Dr. R. I. Rizer, Dr. C. B. Wright.

GENERAL MEDICINE—

Dr. Chas. Drake, Dr. J. P. Schneider, Dr. Frederick H. K. Schaaf.

HEART—

Dr. Olga Hansen.

LUNGS—

Dr. F. W. Wittich.

Hillcrest Hospital

HEART AND LUNGS—

Dr. L. A. Nippert

Hopewell Hospital

TUBERCULOSIS CLINICS—

Dr. F. H. Hacking.

Glen Lake Sanatorium

TUBERCULOSIS CLINICS—

Dr. E. Marriette, Dr. F. W. Wittich.

Thomas Hospital

TUBERCULOSIS CLINIC—

Dr. F. H. Hacking.

Swedish Hospital

MEDICAL CLINICS—

Dr. J. P. Schneider, Dr. S. P. Rees.

Northwestern Hospital

MEDICAL CLINICS—

Dr. J. G. Cross, Dr. J. M. Lajoie, Dr. J. W. Bell, Dr. C. M. Carlaw.

Fairview Hospital

MEDICAL CLINIC: PERNICIOUS ANEMIA—

Dr. H. Peterson.

St. Barnabas Hospital

MEDICAL CLINICS—

Dr. H. B. Annis, Dr. C. P. Aling.

PEDIATRICS.

University Hospital

GENERAL PEDIATRIC CLINIC—

Dr. F. W. Schlutz.

TUBERCULOSIS IN CHILDREN—

Dr. Max Seham.

NEW-BORN CLINIC: BREAST-FEEDING—

Dr. J. P. Sedgwick.

CONGENITAL DEFECTS—

Dr. F. W. Schlutz.

SPASMOPHILIA—

Dr. J. P. Sedgwick.

FUNCTIONAL NERVOUS DISEASES OF CHILDHOOD AND INFANCY—

Dr. E. J. Huenekens

CASE-HISTORIES IN DISEASES OF CHILDREN—

Dr. Max Seham.

DEMONSTRATION OF INTUBATION—

Dr. E. J. Huenekens.

Lymanhurst

INFANT-FEEDING—

Dr. F. W. Schlutz, Dr. F. C. Rodda.

City Hospital—

INSPECTION OF THE MINNEAPOLIS CONTAGIOUS HOSPITAL, AND DEMONSTRATION OF ASEPTIC MEDICAL NURSING—

Dr. F. C. Rodda.

EPIDEMIC MENINGITIS: DIAGNOSIS AND TREATMENT—

Dr. Max Seham.

Abbott Hospital

GENERAL PEDIATRIC CLINIC—

Dr. J. P. Sedgwick.

X-RAY WORK IN CHILDREN—

Dr. F. C. Rodda.

Pillsbury Settlement House

AMBULATORY INFANT-FEEDING—

Dr. E. J. Huenekens.

Swedish Hospital

GENERAL PEDIATRICS—

Dr. F. C. Rodda.

NEUROLOGY.

City Hospital

TECHNIC OF NEUROLOGICAL EXAMINATION WITH ILLUSTRATIVE CASES—

Dr. L. M. Crafts.

CHRONIC CORD DISEASES—

Dr. W. A. Jones.

BRAIN SURGERY—

Dr. H. W. Jones.

SENSORY CHANGES IN PERNICIOUS ANEMIA—

Dr. A. S. Hamilton.

DIAGNOSIS OF LOCOMOTOR ATAXIA.

Dr. Julius Johnson.

DERMATOLOGY.

University Hospital

CLINICS—

Dr. S. E. Sweitzer, Dr. H. E. Michelson, Dr. John Schroeder, Dr. Oscar Owre.

City Hospital.

OPERATIVE CLINIC IN UROLOGY—

Dr. F. R. Wright, Dr. Oscar Owre.

BEDSIDE CLINIC IN UROLOGY—

Dr. F. R. Wright.

University Dispensary

CLINIC IN UROLOGY—

Dr. A. G. Wethall.

CLINIC IN SYPHILIS—

Dr. H. E. Michelson.

CLINIC IN DERMATOLOGY—

Dr. S. E. Sweitzer.

Wells Memorial

CLINIC IN DERMATOLOGY—

Dr. C. A. Boreen.

Asbury Hospital

CLINIC IN DERMATOLOGY—

Dr. G. P. Crume.

ROENTGENOLOGY.

University Hospital

DEMONSTRATIONS IN GASTRO-INTESTINAL FLUOROSCOPY;
PLATE READING IN LUNG AND HEART DISEASES;
AND STUDIES OF VARIOUS TYPES OF BONE- LESIONS.
Dr. F. S. Bissell.

City Hospital

DEMONSTRATIONS IN GASTRO-INTESTINAL FLUOROSCOPY
Dr. C. A. Donaldson.

Asbury Hospital

ROENTGEN DEMONSTRATIONS IN CONJUNCTION WITH
MEDICAL AND SURGICAL CLINICS—
Dr. C. D. Harrington.

Northwestern Hospital

ROENTGEN DEMONSTRATIONS IN CONJUNCTION WITH
MEDICAL AND SURGICAL CLINICS—
Dr. C. D. Harrington.

St. Barnabas Hospital

ROENTGEN DEMONSTRATIONS IN CONJUNCTION WITH
MEDICAL AND SURGICAL CLINICS—
Dr. Kano Ikeda.

LABORATORY.

University Hospital

DEMONSTRATIONS IN PHYSIOLOGY—
Dean E. P. Lyon and Staff.

DEMONSTRATIONS IN ANATOMY—

Dr. C. M. Jackson and Staff.

DEMONSTRATIONS IN PHARMACOLOGY—

Dr. A. D. Hirschfelder and Staff.

LABORATORY DEMONSTRATIONS—

Dr. Frederick H. K. Schaaf.

BLOOD-CULTURES, SPINAL FLUIDS, AND COLLOIDAL GOLD TEST—

Dr. Margaret Warwick.

NEW METHOD OF PREPARING VACCINES—

Dr. W. P. Larson.

Swedish Hospital

WASSERMANN TESTS, ETC.—

Dr. C. R. Drake.

Radisson Hotel

BONE SARCOMA—

Dr. E. T. Bell.

ROUTINE PATHOLOGICAL LABORATORY WORK IN ALL HOSPITALS IN ASSOCIATION WITH SURGICAL AND MEDICAL CLINICS—

Northwestern	Abbott
St. Barnabas	Hillcrest
University	St. Mary's
Swedish	Deaconess
City	Asbury
Eitel	Fairview

St. Andrews

PROBABLY DEMONSTRATIONS BY

The Minnesota State Board of Health Laboratories.

MISCELLANEOUS ANNOUNCEMENTS.

Banquet of the Hennepin County Medical Society and Clinical Section of the Hennepin County Medical Society, Radisson Hotel Roof Garden, Monday, April 8, 7 p. m.

Speakers will be announced later. All visiting physicians are invited to attend.

Scientific Meeting, Gold Room, Radisson Hotel, Wednesday, April 10, 8 p. m. Dr. Lewis Fisher, Philadelphia, and other speakers to be announced later, will address the meeting.

Banquet of the Minnesota Academy of Ophthalmology and Oto-Laryngology, Radisson Hotel, Wednesday, April 10, 7 p. m. Address by Dr. Lewis Fisher, Philadelphia. Visiting ophthalmologists and oto-laryngologists are invited to attend.

Gold Room, Radisson Hotel, Daily, 4:30 to 6 p. m., motion-picture demonstrations of various surgical operations, plate exhibits, and demonstrations in roentgenology, lantern-slides, exhibits, etc. Demonstration of medical inspection in the public schools.

HOTEL RESERVATIONS SHOULD BE MADE EARLY.

OF GENERAL INTEREST

The following County and District Sanatoria are operating at the present time under the supervision of the Advisory Commission with the following superintendents and medical officers:

Nopeming Sanatorium, Nopeming, St. Louis county, Dr. John M. Conroy, Acting Supt. and Medical Director.

Ottertail County Sanatorium, Battle Lake, Ottertail county, Dr. A. G. Kessler, Supt. and Medical Director.

Ramsey County Tuberculosis Pavilion, St. Paul, Dr. A. B. Ancker, Supt.; Dr. H. L. Taylor, Medical Director.

Mineral Springs Sanatorium, Cannon Falls, Goodhue county, Mrs. Mae Geraldson; Dr. L. F. Sutton, Medical Director.

Glen Lake Sanatorium, Hopkins, Hennepin county, Dr. E. S. Mariette, Supt. and Medical Director.

Sunnyrest Sanatorium, Crookston, Polk and Norman counties, Miss Hulda Hultquist; Dr. J. N. Elliot, Medical Director.

Lake Julia Sanatorium, Puposky, Beltrami, Koochiching and Hubbard counties, Dr. W. L. Mattick, Supt. and Medical Director.

Sand Beach Sanatorium, Lake Park, Clay and Becker counties, Miss Mary C. Beall; Dr. H. E. Le Cates, Medical Director.

Buena Vista Sanatorium, Wabasha, Wabasha county, Miss M. E. Ruddick; Dr. L. F. Sutton, Medical Director.

Riverside Sanatorium, Granite Falls; Chippewa, Lac Qui Parle, Yellow Medicine and Renneville counties, Mrs. S. W. Dunton; Dr. L. G. Guyer, Medical Director.

Southwestern Minnesota Sanatorium, Worthington; Lincoln, Lyon, Pipestone, Murray, Cottonwood, Rock, Nobles and Jackson counties, Dr. E. J. Murray, Supt. and Medical Director. Institution has been temporarily closed because of the failure of the water supply.

Oakland Park Sanatorium, Thief River Falls; Marshall, Roseau and Pennington counties, Miss L. E. Fletcher; Dr. J. N. Elliot, Medical Director.

Fair Oaks Lodge Sanatorium, Wadena; Todd and Wadena counties. To open April 15, 1918; Dr. H. E. Le Cates, Medical Director.

Deerwood Sanatorium, Deerwood; Crow Wing and Aitken counties. To open May 15, 1918.

Naval Station Hospital, Unit No. 10, has been formed in Minneapolis with the following personnel:

Clifford E. Henry, grade of surgeon, rank of Lieutenant Commander.

Clinton C. Tyrrell, grade of surgeon, rank of Lieutenant Commander.

John T. Litchfield, grade of past assistant surgeon, rank of Lieutenant.

J. Arthur Riegel, grade of assistant surgeon, rank of Lieutenant (j. g.).

William P. Robertson, grade of assistant surgeon, rank of Lieutenant (j. g.).

The Advisory Commission of the State Sanatorium for Consumptives organized at its first quarterly meeting in 1918 by electing Dr. Pearl M. Hall, of Minneapolis, President; Dr. Edward T. Sanderson, of Minneota, Vice President; Dr. Patrick A. Smith, of Faribault, Secretary; Dr. Robinson Bosworth, of St. Paul, Executive Secretary.

The other members of the Commission are: Dr. Charles F. McComb, of Duluth, and Dr. Charles W. More, of Eveleth.

The office of the Commission is in suite No. 814, Lowry Building, St. Paul.

Dr. L. G. Guyer has been transferred to Riverside Sanatorium, Granite Falls, Minn., where he devotes his full time to the medical care of patients of that institution and to establishing and maintaining rural dispensaries of four counties, Renneville, Yellow Medicine, Lac qui Parle, and Chippewa. Dr. Guyer formerly had charge of the medical services at Sunnyrest Sanatorium, Crookston, Minn., and Sand Beach Sanatorium, Lake Park, Minn.

Dr. J. N. Elliot has taken charge of the medical services at Sunnyrest Sanatorium at Crookston and at Oakland Park Sanatorium, Thief River Falls. Dr. Elliot was formerly connected with the Sea View Hospital, Staten Island, N. Y.

The following members of the St. Louis County Medical Society have been appointed as the Committee on Arrangements for the next meeting of the Minnesota State Medical Association to be held in Duluth, August 28th, 29th, and 30th:

Dr. C. F. McComb, Chairman.
 Dr. W. H. Magie.
 Dr. W. R. Bagley.
 Dr. A. H. Schwartz.
 Dr. C. L. Haney.

At the annual meeting of the Nicollet-Le Sueur Counties Medical Society, the following officers were elected:

President, Dr. L. F. Woodworth, Le Sueur Center, Minn.

Vice President, Dr. O. T. Baskett, St. Peter, Minn.

Secretary, Dr. J. E. Le Clerc, Le Sueur, Minn.

Treasurer, Dr. D. W. McDougald, Le Sueur, Minn.

Censor, Dr. G. F. Merritt, St. Peter, Minn.

Delegate, Dr. G. W. McIntyre, St. Peter, Minn.

Alternate, Dr. H. B. Aitkens, Le Sueur Center, Minn.

Dr. T. B. Hartzell of the University of Minnesota gave a lecture on "Focal Infections" illustrating the same with lantern slides. The dentists of Le Sueur attended the meeting as guests.

Dr. J. M. Conroy, late of the City and County Hospital of St. Paul, has been appointed medical superintendent of Nopeming Sanatorium, near Duluth, Minn., to serve during the absence in France of Dr. A. T. Laird.

Dr. W. L. Mattick has received the appointment as Superintendent of the Lake Julia Sanatorium, Puposky, Minn., Dr. Mattick formerly was connected with the Raybrook Sanatorium, N. Y., and the United States Dept. of the Interior.

Miss Lydia E. Fletcher, R. N., was appointed Superintendent of the Oakland Park Sanatorium, Thief River Falls, which opened its doors for patients January 1st.

Dr. E. J. Murray, Superintendent of the Southwestern Sanatorium, Worthington, Minn., has resigned to take effect April 1st.

The regular quarterly meeting of the Advisory Commission will be held in the office in the Lowry Building, April 5th, 1918.

That excavations are being made for the new Deaconess hospital at Billings, Montana, has been announced by the Deaconess hospital association. The cost will be about \$140,000. The board of trustees for the association are: B. G. Brockway, Jacob Werner, C. J. Eddy, Roy I. Covert, O. B. Farnham, and George Mecklenberg.

Dr. H. E. LeCates, formerly Superintendent of the Blue Grass Sanatorium, Lexington, Ky., arrived March 1st to take charge of the medical services of Sand Beach Sanatorium, Lake Park, Minn. He will also have charge medically of the Fair Oaks Lodge Sanatorium, Wadena, Minn., when that institution opens about April 15th.

The Todd-Wadena County Sanitarium at Long Prairie, Minn., will soon be ready to receive patients.

Dr. O. L. Peterson, who has practiced medicine at Lafayette, Minn., for the past three years will move to Cokato, Minn.

NEW AND NON-OFFICIAL REMEDIES

During February the following articles were accepted by the Council on Pharmacy and Chemistry for inclusion with New and Non-official Remedies:

The Abbott Laboratories:

Chlorcosane
Barbital-Abbott
Procaine-Abbott

Dermatological Research Laboratories, Philadelphia Polyclinic:

Arsenobenzol (Dermatological Research Laboratories), 1 Gm. Ampules.

Eli Lilly and Company:

Typhoid Vaccine, Prophylactic
Typhoid Vaccine, Therapeutic
Typhoid Mixed Vaccine, Lilly

Merck and Company:

Mercury Benzoate-Merck
Monsanto Chemical Works:
Halazone-Monsanto

H. K. Mulford Company:

Bulgarian Bacillus, Friable Tablets.

NEW AND NON-OFFICIAL REMEDIES.

Barbital.—Diethyl-Barbituric Acid, first introduced under the name veronal. In small doses barbital is a relatively safe hypnotic, but fatalities have followed its indiscriminate use. It is claimed to be useful in simple insomnia, as well as in that accompanying hysteria, neurasthenia and mental disturbances. From 0.3 to 1 Gm. (5 to 15 grains) in hot water, tea or milk, or, if in wafers or capsules, followed by a cupful of some warm liquid.

Barbital-Abbott.—A brand of barbital complying with the New and Non-official Remedies standards. The Abbott Laboratories, Chicago.

Mercury Benzoate-Merck.—A brand of mercuric benzoate complying with the New and Non-official Remedies standards. Mercuric benzoate has the properties of mercuric chloride. It has been said to be useful for hypodermic use and in gonorrhea. Merck and Company, New York.

Chlorcosane.—A liquid obtained by chlorinating solid paraffin. It contains about 50 per cent of chlorin in stable combination. Chlorcosane is used as a solvent for dichloramine-T; with it, solution containing as much as 8 per cent may be prepared. When used in a hand atomizer, chlorcosane solutions of dichloramine-T may be made less viscous by the addition of 10 per cent of carbon tetrachloride. The Abbott Laboratories, Chicago.

Betanaphthyl Salicylate-Calco.—A brand of betanaphthyl salicylate complying with the New and Non-official Remedies standards. Betanaphthyl salicylate is believed to act as an intestinal antiseptic and, being excreted in the urine, to act in a similar way in the bladder. It is said to be useful in intestinal fermentations, catarrh of the bladder, particularly gonorrheal cystitis, rheumatism, etc. The Calco Chemical Co., Bound Brook, N. J.

Acetylsalicylic Acid-Merck.—A brand of acetylsalicylic acid complying with the New and Non-official Remedies standards. Acetylsalicylic acid is employed in rheumatic conditions, and especially as an analgesic and antipyretic in colds, neuralgias, etc.

Chlorazene Surgical Powder.—An impalpable powder composed of chlorazene, 1 per cent; zinc stearate, 10 per cent, and sodium stearate, 89 per cent. Chlorazene Surgical Powder is absorbent, slightly astringent, and forms a closely adherent film when applied to the skin. It may be dusted freely over denuded or abraded areas, cuts, wounds, and skin eruptions. The Abbott Laboratories, Chicago. (Jour. A. M. A., Feb. 16, 1918, p. 459).

PROPAGANDA FOR REFORM.

Phenalgol and Ammonol.—At the time that synthetic chemical drugs were coming into fame and when every manufacturer who launched a new headache mixture claimed to have achieved another triumph in synthetic chemistry, Ammonol and Phenalgol were born and duly christened with chemical formulas. However, one of the first reports of the Council on Pharmacy and Chemistry showed them to be mixtures composed of acetanilid, sodium bicarbonate and ammonium carbonate. Since then the unwarranted claims made for these preparations have been exposed repeatedly, and the danger of the indiscriminate use of headache mixtures pointed out. Despite the exposure of the methods used in exploiting Ammonol and Phenalgol, one finds just as glaringly false statements made in the advertisements of Phenalgol today as were made in its unsavory past. This would seem to indicate either that physicians have short memories or that they are strangely indifferent to the welfare of their patients, to their own reputation, and to the good name of medicine. (Jour. A. M. A., Feb. 2, 1918, p. 337).

Absorption and Excretion of Mercury.—It may be regarded as clearly established that, in addition to the kidneys, the stomach may participate in this eliminatory function quite as well as the other portions of the alimentary tract. The occurrence of severe intoxications from the use of mercuric chloride in vaginal douches is likewise recognized. The absorption of mercury through the sound skin has been in dispute. To account for the efficacy of mercurial inunction, the contention has been made that the mercury thus applied is volatilized and absorbed through the lungs in greater part if not entirely. Experiments in the dermatologic laboratories of the Philadelphia Polyclinic leaves little doubt that the skin is an important, perhaps the most important path of absorption of mercury applied by inunction. (Jour. A. M. A., Feb. 9, 1918, p. 392).

Basy Bread.—This is an asserted obesity cure put out by the Doctors' Essential Food Company,

Orange, N. J. The advertising claims are extravagant and typical of other obesity treatment literature. Analyses indicated that in composition Basy Bread was similar to graham bread. Basy Bread sells for \$1 a loaf. Dr. Wiley well sums up the case thus: "There is one way in which Basy Bread will reduce, that is, don't eat any of it nor much of it nor much of any other kind." (Jour. A. M. A., Feb. 9, 1918, p. 407).

Campho-Phenique.—The Secretary of the Harvard University Medical School received, from the Campho-Phenique Company of St. Louis, a letter stating that the concern wishes to supply the senior students of all Medical Colleges with samples of Campho-Phenique and Campho-Phenique powder and ointment, and asking the number of students and the name of every student in the graduating class. The Campho-Phenique concern believes in following the old advice, "Catching them young." In 1907, the Council on Pharmacy and Chemistry reported that Campho-Phenique (liquid) was exploited under a false "formula," that it was a solution of camphor and phenol in liquid petrolatum, and that for all practical purposes Campho-Phenique Powder was essentially a camphorated talcum powder containing apparently sufficient phenol and camphor to give the powder an odor. The report of the Council further brought out that the Campho-Phenique Company was in effect one of the numerous trade names adopted by one James F. Ballard. Mr. Ballard seems to market a number of "patent medicines," for some of which Mr. Ballard has pleaded guilty in the federal courts to making false and fraudulent claims. (Jour. A. M. A., Feb. 9, 1918, p. 408).

Sodium Bicarbonate.—Few patients will object to the taste of sodium bicarbonate if the required dose is administered dissolved in a convenient quantity of cold water. The taste may be disguised by dissolving the sodium bicarbonate in carbonated water or else by adding a little sugar and lemon juice to ordinary water. Sodium bicarbonate may also be prescribed in the form of tablets. Though it is better that these be allowed to dissolve in the mouth, in most cases they are swallowed without discomfort. (Jour. A. M. A., Feb. 9, 1918, p. 410).

Acetylsalicylic Acid and Phenyl Salicylate Incompatible with Alkalies.—In the presence of moisture, acetylsalicylic acid is decomposed by magnesium oxide (calcined magnesia), as is also phenyl salicylate (salol). Hence these drugs should not be combined with magnesium oxide in a prescription. (Jour. A. M. A., Feb. 9, 1918, p. 410).

Fellows' Syrup, and other Preparations of the Hypophosphites.—An advertisement for Fellows' Syrup reads: "Fellows' Syrup differs from other preparations of the hypophosphites. Leading clinicians in all parts of the world have long recognized this important fact. Have you? To insure results, prescribe the genuine Syr. Hypophos. Comp. Fellows'. Reject cheap and inefficient substitutes.

Reject preparations 'just as good.'" In truth, Fellows' Syrup is not like the better preparations of this type, since after standing it contains a muddy looking deposit that any pharmaceutical tyro would be ashamed of. Examination of the literature used in the exploitation of Fellows' Syrup fails to disclose any evidence to show that it has therapeutic value. Not only is there an entire absence of any evidence of its therapeutic value, but there is an abundance of evidence that the hypophosphites are devoid of any such therapeutic effects as they were formerly reputed to have, and that they are, so far as any effect based on their phosphorus content is concerned, singularly inert. As the result of its investigation of the therapeutic effects of the hypophosphites, the Council on Pharmacy and Chemistry concluded: There is no reliable evidence that they exert a physiologic effect; it has not been demonstrated that they influence any pathologic process; they are not "foods." If they are of any use, that use has never been discovered. (Jour. A. M. A., Feb. 16, 1918, p. 478).

Calcium Iodide in Tuberculosis.—There appears to be no work to indicate that the intravenous administration of calcium iodide in tuberculosis is of value. It has not been demonstrated that tuberculosis is associated with a deficiency of calcium. On the other hand, experiments demonstrate that the administration of calcium does not change the calcium content of the blood. Furthermore, there is no evidence to warrant the intravenous administration of iodides. (Jour. A. M. A., Feb. 16, 1918, p. 481).

Bell-Ans (Papayans, Bell).—"Are you going to sit there and let the other folks eat up all the good things just because you are afraid to pitch in, when 2 or 3 Bell-Ans taken before and after the meal would enable you to enjoy your share of all that's coming without a bit of discomfort or distress? Bell-Ans has restored the pleasures of the table to thousands who say: 'I can now eat anything and plenty of it, too.'" The New York Tribune comments that such an advertisement as this is not limited to the evil effects to the misguided individual who eats lobster and ice cream at midnight and trusts to Bell-Ans to atone for his indiscretion. The most serious effect of such reckless advice is the example which the advertising sets to other advertisers. (Jour. A. M. A., Feb. 23, 1918, p. 557).

Antiphlogistine.—A. G. Gould, M. D., Plant Physician to the Goodyear Tire and Rubber Company, writes that after corresponding with the physicians in charge, he finds incorrect the claims of the Denver Chemical Mfg. Company, regarding the use of Antiphlogistine by certain establishments. He asks: Is there not some way that such exploitation of our large companies can be prevented? (Jour. A. M. A., Feb. 23, 1918, p. 557).

Syphilodol.—According to the French Medicinal Company, Inc., which markets the product, Syphilodol "is a synthetic chemical product of silver, arsenic

and antimony . . ." Nowhere in the advertising matter is there a more comprehensive statement regarding the composition of this "new synthetic" than that just quoted. The product is being examined in the A. M. A. Chemical Laboratory: the examination having advanced sufficiently to show that Syphilodol contains considerable quantities of mercury. Although the advertising leaflet claims that the preparation is "the formula of the late Dr. Alfred Fournier of Paris" and has been exhaustively tested by Metchnikoff, a careful search of French medical journals fails to show any report on Syphilodol. (Jour. A. M. A., Feb. 23, 1918, p. 559).

Trousseau's Wine.—This obsolete combination of drugs acting on the heart and kidneys is made by maceration of digitalis, squill and juniper berries in wine and alcohol, and adding potassium acetate to the expressed liquid. (Jour. A. M. A., Feb. 23, 1918, p. 559).

Pyxol.—This is a proprietary preparation somewhat similar to the compound solution of cresol of the U. S. Pharmacopia. In 1915 Pyxol was declared misbranded under the Insecticide Act. (Jour. A. M. A., Feb. 23, 1918, p. 559).

Luminal.—Chemically, luminal is phenyl-ethyl-barbituric acid, and differs from veronal only in that one ethyl group is replaced by a phenyl group. Luminal is claimed to be a useful hypnotic in nervous insomnia and conditions of excitement of the nervous system. (Jour. A. M. A., Feb. 23, 1918, p. 559).

REPORTS AND ANNOUNCEMENTS OF SOCIETIES

MINNESOTA ACADEMY OF MEDICINE.

The regular meeting for the month of February was held at the Town and Country Club on Wednesday evening, the 13th, President Cross in the chair. Dinner preceded the meeting.

Following the reading of the minutes, case reports were made by Drs. Colvin, Owre, Mann, Benjamin, Nippert, Hammes, Sweetser, and Cross.

Three formal papers were presented later, one by Dr. Judd on "Esophageal Diverticula," one by Dr. Huenekens (his inaugural thesis) on the "Prophylactic use of Pertussis Vaccine," and one by Dr. Farr, describing the technic for removal of calculi from the lower ureter and bladder. All three papers were freely discussed, the meeting continuing till a late hour.

Thirty-four members and five visitors were in attendance.

REPORTS OF CASES.

Dr. Cross reported a case of carcinoma of the gall-bladder in a woman fifty-six years of age. Nothing unusual was noticed in her condition until last November, when she had an attack of diarrhea. This continued for two or three weeks, and was accompanied by nausea and vomiting. She began to lose in weight, so much so that by New Year's day it had been reduced as much as forty pounds. At no time was there pain or jaundice. The vomiting gradually assumed stomach-retention type. She was brought to the hospital early in January. At this time the urine was scanty—185 c. c. for the first twenty-four hours—and contained a large amount of albumin, some red blood cells, and was loaded with hyaline and granular casts. Blood pressure was 102 and 164; no headache; eye grounds normal; urea nitrogen in the blood (15 grams per 100 c. c.); creatinin, 1.26, also within normal limits. Urea in urine was increased in amount. The renal condition improved rapidly, but the vomiting continued. No blood or pus was contained in the stools. The vomitus showed free HCL in amounts from 0.7 to 17, with a total acidity of 50 to 60. It contained no blood. Upon palpation an indefinite mass in the right hypochondrium had been reported by her physician before she came to the hospital; but of this we were not able to say with certainty that there was anything more than a sense of resistance on inspiration. X-ray examination showed a large and low stomach. The gastric capacity was 55 ounces. The pylorus was evidently constricted. A shadow of barium suggested a hernia into the lesser peritoneal cavity. Vomiting continued, the stomach rejecting its contents more and more frequently. The patient died February 11th from circulatory failure. At autopsy there was found: healed tuberculosis (calcified) of one apex; heart normal; general nephrosis,—no glomerular nephritis; stomach large, but otherwise normal, except at the pyloric end. The gall-bladder was nearly obliterated by a carcinoma containing gall-stones, the mass extending into the liver and invading the duodenum. The pylorus would hardly admit a probe the size of a goose-quill. The common duct was free. No metastasis was found.

Primary carcinoma of the gall-bladder is of comparatively infrequent occurrence, about 300 cases having been reported. Seventy per cent to 90 per cent are said to be due to gall-stones. It is usually of the cylindrical-cell type, but may be of the round or of the squamous-cell variety. Dissemination is rare, but extension to the duodenum, stomach, pancreas, and gall ducts is common. Icterus occurs in about one-half of the cases. Diagnosis is especially difficult and can only be made out with certainty by exploration. It seems to be characteristic of a cancer in this location that its progress is rapid, for death usually follows in a few months.

Dr. Owre showed a number of X-ray plates. One showed a stone in the pelvis of the right kidney; an-

other showed the radiographic catheter in the pelvis, touching the stone. Attention was called to the fact that this was a better method of locating the stone than filling the pelvis of the kidney with thorium. The patient was a woman seventy-six years of age and the stone was removed by a pyelotomy under gas anesthesia. Another case was illustrated with four X-ray plates. The patient was a woman about thirty years of age who had a stone about the size of a bean in the interstitial portion of the left ureter. The first plate showed the stone. The second plate showed the stone in contact with the radiographic catheter. The third plate was taken after warm glycerine had been injected, and showed the axis of the stone to have been changed. And the fourth plate showed the pelvis free from the stone, its removal having been accomplished by dilating the lower ureter with successive increasing sizes of dilators.

FRED ELMER LEAVITT,
Secretary.

CORRESPONDENCE

MINNEAPOLIS CLINIC WEEK.

To the Editor:

The clinics to be held in Minneapolis from April 8th until April 12th, inclusive, under the auspices of the Clinical Section of the Hennepin County Medical Society, will embrace the various departments of surgery and medicine, including all the specialties. Every hospital in Minneapolis will extend the courtesies of the clinics to visiting doctors. If there are several hospitals giving clinics at the same time, it will give them an opportunity to select whatever they choose in the way of clinical material. The Minneapolis City Hospital and its dispensaries and the University Hospital and its large dispensary will offer the same facilities that are offered by other hospitals for clinical demonstrations of various kinds, and we expect to show some unusual cases, as well as cases that are commonly seen in general practice.

The aim of the Clinical Week is to present material which is more or less familiar, and not to make clinics of exceptional cases. We propose, therefore, to show cases of tuberculosis in its various stages, and diseases of children of the simple types. We want our visitors to thoroughly understand that this is not to be a clinic under the auspices of surgeons entirely, but that medical men will have just as many cases to present, as well as men who are in special lines of work.

The Committee on Arrangements will be glad to take care of hotel reservations if desired; and if requests are sent to the secretary, 1114 Donaldson Building, headquarters of the clinic, they will be promptly cared for.

Yours truly,
E. J. HUENEKENS, M. D.,
Secretary.

PROGRESS IN MEDICINE AND SURGERY

THE REPAIR AND RECONSTRUCTION OF THE HEPATIC AND COMMON BILE DUCTS: Ellsworth Elliot, Jr. (Surg., Gyn. and Obst., Jan., 1918) discusses only the benign strictures of the ducts, which in most instances are secondary to previous operative procedures. He itemizes the anatomical and pathological predisposing causes for stricture, the most important of these being: abnormal course of the cystic duct; pathology leading to a great dilatation of the cystic duct which may be mistaken for the gallbladder; technical errors, resulting in damage to the common or hepatic ducts; obliteration of anatomical landmarks by inflammatory processes.

The author reviews the technic for cholecystectomy, recommending that the junction between the hepatic and cystic ducts should be recognized before the cystic duct is divided. Following division of the duct, the pedicle should be carefully examined and if the hepatic duct has been partially or completely severed, an immediate repair must be done.

The suggestions regarding the technic of cholecystectomy are merely meant for the prevention of stricture formation. The extent and location of the stricture is of great importance in determining the selection of a procedure to be used for its correction.

I. Stricture in either or both hepatic and common ducts in which the duct above and below is relatively normal and surgically accessible.

(a) Linear incision which is analogous to the external urethrotomy for strictural urethra. This method was used in the author's first case.

(b) End to end anastomosis.

(c) In cases where there is a long gap between the divided ends of the duct or in cases where extensive scar tissue formation requires considerable bridging of the gap a rubber tube is used. The posterior edges of the ducts are anchored to the gastrohepatic omentum. The catheter is inserted with the duct above and below (if possible through the papilla) and into the duodenum. Over the exposed tube a visceral pedunculated flap is sutured. The flap may be a portion of stomach, duodenum, gallbladder, etc.

II. Strictures situated in the lower end of the common duct including the orifice at the papilla.

(a) Direct anastomosis between the dilated duct above the point of stricture with either stomach, duodenum or small intestine.

(b) Formation of a new channel with the aid of a rubber tube.

The author states the dangers of the above cited methods: Leakage of intestinal contents into the peritoneal cavity, regurgitation of intestinal contents into the newly-formed duct channel, ascending infection with the formation of hepatic abscess.

III. Stricture of the hepatic duct inaccessible to the surgeon. In these cases hepatostomy is advised,

i. e., the production of a biliary fistula by puncture of the liver parenchyma with the actual cautery.

The paper is followed by a careful report of the author's cases, cases reported from the literature, and personal communications.

GEORGE A. GEIST.

APPLICATION OF THE FACTORS CONTROLLING CARRIERS OF COMMUNICABLE DISEASE: D. M. Lewis (Interstate Med. Jour., Vol. XXV, No. 1) believes it is possible to control these communicable diseases in which we have an accurate knowledge concerning the carriers. One factor in making a carrier is nasopharyngeal obstruction of any degree and injury. Race is a factor. (He says negroes are particular to keep their noses clean and that Jews or Italians fear so to do.) Climatic conditions are a factor. So is carelessness. Measures built up around the carrier may control the disease. If this is carried a step further and measures are built up around the factors causing carriers, then responsibility for sporadic incidence may be shown to lie with health departments.

C. E. SMITH, JR.

A CLINICAL CONTRIBUTION TO THE STUDY OF P. U. O.: Pasteur and Hudson (Lancet, Vol. I, No. 3, 1918) report a case of P. U. O. in which unusual changes of lobar distribution in the right base occurred. The onset was acute, terminated by crisis, no catarrhal symptoms, no consolidation and subsequent resolution. The only signs present were those of diminished air entry in the affected part.

They believe the featureless aspect of many cases of diagnosed P. U. O. is because they are the clinical expressions of smouldering bacterial infections which have failed to become fully active. The case reported might have been an abortive one of pneumonia. Because of this abortive characteristic it was practically featureless and could only be labelled P. U. O.

C. E. SMITH, JR.

THE PRIMARY LESION OF TUBERCULOSIS: W. W. Howell (Boston Med. and Surg. Jour., Vol. CLXXVIII, No. 5) regards the primary focus of tuberculosis as anywhere the bacilli happen to locate, but says this is most often the lungs or intestine. If infection occurs through the lung the primary lesion is in the bronchial glands (if intestinal, then the lesion is in the mesenteric glands). The primary lesion is most important as it may give only symptoms of anemia, fever, indigestion, or the like. The lesion occurs almost always in children. The chest examination gives signs of enlarged bronchial glands. The treatment is rest and food.

When signs of pulmonary tuberculosis develop (cough, expectoration, rales, etc.) the primary stage is past. Neglected primary lesions go on to these signs.

The old idea that a baby may be infected but not have the disease must be discarded. If in such instances one waits for signs, the primary stage is past. Early recognition and treatment are half the battle when combating pulmonary tuberculosis.

C. E. SMITH, JR.

MASSIVE SPONTANEOUS HEMORRHAGES INTO THE VITREOUS: L. F. Appleman (Am. Jour. of Ophth., Vol. I, No. 1, January, 1918) records three cases of massive spontaneous hemorrhage into the vitreous and follows the case reports by a discussion of the etiology and treatment of such a condition.

Etiology: Noll states that recurrent intraocular hemorrhage may arise from: (1) Alterations in the blood (leukemia, pernicious anemia); (2) circulatory changes met with in puberty; (3) local vascular disease due to malaria, septic absorption, degenerative changes in the vessels, and hemophilia.

Among other causes is tuberculosis, considered by Axenfeld as the underlying factor in the production of intraocular hemorrhage in young persons often attended with a retinal periphlebitis. Syphilitic infection, renal disease and trauma are capable of giving rise to intraocular hemorrhage.

Treatment: Local treatment is administered for the purpose of hastening absorption of vitreous hemorrhages and according to Ormond is accomplished in the following manner: (1) the fluid is carried away by lymphatics and blood vessels; (2) the solid constituents are removed by the leucocytes; the red corpuscles are destroyed and assimilated, the blood pigment being found subsequently in the surrounding tissue and lymph glands; and, lastly, the fibrous coagulation remaining is invaded by fibroblasts which gradually convert the residue into fibrous tissue which contracts and decreases the volume of the exuded mass.

Local therapy may consist of one or more of the following agents: (1) Massage, (2) Ionization, (3) Subconjunctival injections, (4) Removal of some of the fluid and its substitution by normal saline, (5) Fibrolysin, (6) Potassium iodide, (7) Dionin, (8) Radium.

Reviewer's Note.—Too much space is devoted to local therapy. That so many methods are advocated for the purpose of hastening the removal of intraocular hemorrhage points clearly to the fact that no one method is overwhelmingly superior to the others. Too much credit is often given to the method employed and too little to unaided nature.

The crux of the question is: What is the underlying cause of such hemorrhages? In most instances we are dealing with a local symptom the result of a constitutional malady. Tuberculosis and syphilis should first be excluded and the urinary findings and blood picture considered.

Constitutional treatment is the all important measure in therapy, local agents holding a subsiding position. Hemorrhage into vitreous may resolve with or

without local treatment only to recur at a later period. Therefore, endeavor to determine the causus and institute therapeutic measures for its betterment.

PAUL D. BERRISFORD.

THE ROLE OF THE DUCTLESS GLANDS IN OPHTHALMOLOGY: Frank R. Spencer (Am. Jour. of Ophth., Vol. I, No. 2, February, 1918) discusses the role of the ductless glands in ophthalmology with three illustrative cases. That the eye may be influenced by the secretion of the ductless glands is well known. Just what these changes are and the manner of production has yet to be elucidated.

Thyroid: The following are the commonly recognized signs and symptoms of exophthalmic goitre:

1. Knies' sign is manifested by dilated and often unequal pupils. However, there is retained reflex activity. This is due to stimulation of the sympathetic and is often present in the early stage of goitre. According to Lamb there may be associated with this a low grade chorioretinitis of the macula, and ciliary congestion. He believes this is worse in the eye with the more widely dilated pupil.

2. Von Graefe's sign, which consists in lagging of the upper lid in looking down.

3. Gifford's sign evidenced by difficulty in evert-ing the upper lid. This is due to retraction and rigidity and often occurs early in the disease.

4. Dalrymple's retraction of the upper lid with widening of the palpebral aperture.

5. Mueller's sign, which is the same as Dalrymple's except that he includes the lower lid.

6. Next comes Höman's or Rosenbach's sign of tremor of the upper lid.

7. Stelwag's diminished frequency of winking often followed by a rapid succession of winks or a long interval without winking.

8. Retraction of the upper lid while an object is being fixed is Kocher's sign.

9. Joffroy's is present upon failure of the forehead to wrinkle, when the head is lowered and the patient looks up.

10. Aschner found that the pulse can be made slower by pressure upon the eyeball.

11. Loewe believes that adrenalin dilates the pupil in such cases.

12. Berger has called attention to lacrimation as an early symptom of Graves' disease. He believes this is due to stimulation of the sympathetic. Schmidt-Rimpler, on the other hand, believes this is due to irritation of the conjunctiva, as a result of the exophthalmos.

13. Jellinek and Rosin have noted the early pigmentation of the lids which later disappears.

14. Sattler and Gifford have each mentioned a solid-looking thickening immediately beneath the eyebrow and the latter author states this is found early and without marked exophthalmos.

15. Möblus noted a deficiency in, or even a complete loss of convergence power.

16. Sattler has attributed the occasional falling of the eyelashes and eyebrows to trophic disturbance.

17. Becker found spontaneous arterial pulsation of the retinal arteries in six cases out of seven of this disease.

18. As a new ocular symptom of exophthalmic goitre Suker has described a "deficient complementary fixation in lateral eye rotation" as follows: "After extreme lateral rotation of the eyes to either side with the head fixed and with fixation of an object at this point maintained for a second or two, on attempting to follow this fixation point as it is rapidly swung into the median line, one of the eyes—it may be either—fails to follow the other in a complementary manner into proper convergence and from this point when it is brought into the median plans. Either the right or left eye makes a sudden rotation into the fixation with its fellow, but before it does so, an apparent divergent strabismus is manifested. According to Suker, it is no doubt due to a dissociation in the functions of the sympathetic and the extra-ocular motor nerves of the eye, and perhaps also to exhaustion on extreme lateral rotation of the eyes."

19. Ocular bruit has often been mentioned as a symptom and has been discussed at great length many times.

20. A very infrequent symptom is ocular nystagmus.

Parathyroids: Insufficiencies of the parathyroids may be responsible for zonular cataract, due to eclampsia, convulsions of childhood, tetany, or epilepsy.

Pineal Gland: The secretion, if there be any, does not have any effect upon the eye, whatever ocular symptoms resulting from hyperplasia being due to pressure.

Thymus: In contrast with stimulation of the sympathetic by thyroid hypersecretion is stimulation of the vagotonic or autonomic system by hypersecretion from the thymus. Under such circumstances we find contracted pupils, narrow palpebral apertures, esophoria, spasm of accommodation, deep ciliary congestion and chorioretinal and scleral disturbances of circulation.

Adrenals: In regard to the role played by the adrenals the author states: "It is now, I believe, a well recognized fact that hypersecretion from the adrenals stimulates all the other ductless glands as well as the sympathetic system."

Pituitary: Bitemporal hemianopsia is present as a late symptom in 40 per cent of cases. The fields, according to Cushing, may early show a slight contraction from pressure of the pituitary upon the chiasm, and a homonymous hemianopsia is by no means uncommon. Neuroretinitis and optic atrophy are almost always late symptoms of the disease although the former may occur very early. Paralysis of the third nerve occurs in 15 per cent of cases according to Uhthoff. G. E. de Schweinitz has called attention to "antecedent amblyopia" as a very early and probably not a constant symptom of disease of

the pituitary. Other authors have reported superior temporal slant of the peripheral field, scotomas and hemichromatopsia.

PAUL D. BERRISFORD.

THE DIFFERENTIATION OF SYPHILITIC AND TUBERCULOUS PULMONARY LESIONS: W. C. Klotz (California State Journal of Medicine, Vol. XVI, No. 2) finds that in thirty-one cases reported as pulmonary lues there were present symptoms and physical signs generally accepted as characteristic of pulmonary tuberculosis, and that in the majority of these cases a diagnosis of pulmonary tuberculosis had been made and that many of the patients had been treated as such. A subsequent diagnosis of pulmonary lues had been made only after the usual and accepted methods of diagnosis had been employed and additional facts obtained by careful histories and more thorough examinations. The experience and reputation of many of the authors reporting these cases would in itself assure us of the correctness of the diagnosis as reported. At the same time certain sources of error have been pointed out and conceded, while possible objections have been anticipated.

At a time when many are beginning to recognize certain limitations and sources of error in the diagnosis of pulmonary tuberculosis, it may be well to recall other conditions that may bring about pulmonary changes. One certainly may err in making a diagnosis of tuberculosis on insufficient grounds and in so doing subject our patient to considerable loss, annoyance and worry. The clinical, social and economic significance of such errors is too obvious to require further discussion.

E. T. F. RICHARDS.

A COMPARATIVE STUDY OF INFANTILE PARALYSIS, ANIMAL DISTEMPER, AND ITS RELATED DISEASES: L. D. Bristol (The Jour. of Med. Research, Vol. XXXVII, No. 3) has considered the subject from the standpoints of (1) the work of other investigators, (2) the reported experiments of the present, and (3) a hypothesis as a basis for future studies.

He has endeavored to show that there are certain rather suggestive epidemiological, pathological, and clinical characteristics common to distemper (and its related diseases of lower animals) and human infantile paralysis.

He has also endeavored to show by bacteriological and serological experiments that possibly the above analogies may be extended to include biological similarities in the infecting organisms concerned. From these studies he ventures to suggest the possibility that the organism of poliomyelitis is a pleomorphic bacillus (often indistinguishable, however, from a true coccus) and that it may be closely related to the large group of so-called bipolar bacilli, or Pasteurella (Lignieres). It would seem that all of these

organisms, including that of so-called poliomyelitis, have the power to adapt themselves somewhat to variable degrees of oxygen tension.

The chief theoretical suggestion is that infantile paralysis may be nothing more than the manifestation of a common, widespread human Pasteurellosis—the non-paralytic (a better name than “abortive”) cases, representing chiefly the digestive and respiratory types of the disease, while the paralytic cases may be included in the nervous type.

Based on this assumption, the mode of spread may be considered analogous to that demonstrated for all forms of Pasteurellosis in animals, namely: (1) directly, by contact with the fresh secretions or excretions of an infected individual (either diseased or a healthy “carrier”); (2) indirectly, by the carriage of the specific organisms by insects, or possibly in dust, uncooked food, or drink.

Considering the epidemiology of the disease in this light, the great variation in virulence which is characteristic of the various bipolar bacilli must be kept in mind. Thus, bipolar bacilli causing disease in one animal is most virulent for that particular species of animal, but (though somewhat less virulent) this same strain of organism may at times cause symptoms of similar disease in other species. Hence, we might believe that sporadic cases, small outbreaks, or local “out-croppings” in epidemics of a human Pasteurellosis have their origin in lower animal “reservoirs;” but that severe, wide-spread epidemics, and the gradually increasing prevalence of the disease, are due more to the passage of a human strain of the organisms (of a steadily increasing virulence) directly or indirectly from person to person.

E. T. F. RICHARDS.

THE TREATMENT OF SYPHILIS: Harrison, (Quarterly Journal of Medicine, Vol. 10, No. 40), gives a detailed critical review of the treatment of syphilis. The remedies employed are arsenic, antimony, silver, mercury, iodine, sulphur and iron compounds. A detailed chemical description is given of salvarsan, neosalvarsan, and the other arsenical compounds. The various methods of administration and instruments used are fully described.

By testing for the amido group of 606, it can be found in the circulating blood for over one and one-half hours, but can no longer be detected as such, after three hours. In the urine, it was observed from a few minutes to 12 hours after the injection. It was found once only in the vomit. Swift & Ellis showed that the heating of the serum increased its anti-spirochaetal and therapeutical power. When salvarsan is injected intravenously in concentrated solution, it is excreted much more slowly. The excretion of neosalvarsan is much more rapid than that of 606. In the organs, such as the spleen, heart, lungs, kidneys and liver, arsenic can be demonstrated for several months after an injection of salvarsan. However, none can be found in the parenchyma of the brain.

The bowels excrete from two to ten times as much of the arsenic as the kidneys. There is usually a fall of blood pressure after an intravenous injection, probably due to the action on the heart.

The main side effects due to the intravenous injections were as follows:

Those occurring during or immediately after the injection:

- (a) Vaso-motor disturbances.
- (b) Syncope.
- (c) Pains in the gums and teeth.
- (d) Peculiar taste in the mouth.

Those occurring after several hours:

- (a) Rigor; rise of temperature; headache.
- (b) Vomiting; diarrhea; pain in the back; cramp in the legs.
- (c) Urticaria and herpes.

Those occurring from a day to a month after an injection:

- (a) Albuminuria.
- (b) Stomatitis.
- (c) Chronic headache; lassitude; loss of appetite, weight and sleep.
- (d) Erythema.
- (e) Jaundice.
- (f) Cerebral Symptoms.

Alcoholics and patients during pregnancy are more susceptible to Salvarsan. Previous medication with mercury also increases the susceptibility. Some of these reactions may be due to the release of endotoxins from killed spirochaetes or due to temporarily increased antimotile activity of the same. The main contra-indications for the use of Salvarsan and its allied drugs, are myocarditis, renal and hepatic disease, arterio-sclerosis, aneurism, diabetes and advanced disease of the central nervous system. In cases of gumma of the brain, the injection should be given cautiously, because of the tendency to hemorrhage. Patients with a natural tendency to dermatoses frequently have marked reactions as manifested by eczema, erythema and urticaria.

The author recommends the excision, cauterization and application of 30 per cent Calomel ointment to the local sore. He gives a course of 2.5 to 3 grams of Salvarsan, injections being given on the first, tenth, thirtieth, fortieth and fifty-fifth days. This is combined with mercury and a second similar course administered after an interval. This method is continued until the Wassermann in the blood has become negative. Then the spinal fluid is examined also. The various courses of treatment, as outlined by different authors, are described in detail. In syphilis of the central nervous system, either the intensive method is used or the combined intravenous and intraspinal methods are employed.

E. M. HAMMES.

HEART FAILURE AND THE ADMINISTRATION OF DIGITALIS: Flint (*The Practitioner*, Vol. 49, No. 5), discusses the mechanism of the normal conduction of the cardiac impulse from the sino-aortic

node through the auriculo-ventricular bundle to the ventricles. He limits his discussion of the action of digitalis to heart disease not produced by acute infections, as he claims digitalis has no effect in these cases. He states that digitalis has very little effect on the rate of a heart with normal rhythm and agrees with Mackenzie that there are but few conditions other than auricular flutter and auricular fibrillation improved by digitalis.

Recent observations on irritable hearts in soldiers have shown that forty-five to sixty minims of digitalis tincture given for fourteen days produced practically no effect.

The author believes that "the increased rate of cardiac contractions plays no part in the causation of heart failure." He defines abnormal rhythm existing where the stimulus starts elsewhere than the sino-aortic node. Extrasystole therefore is not an abnormal rhythm, merely an abnormal contraction. From a practical standpoint it may be said that the great majority of abnormal rhythms are auricular flutter and auricular fibrillations, the latter being more common. In auricular flutter the auricles contract rapidly but regularly. The origin of the impulse is in the auricular wall and the ventricle contracts regularly every second, third or fourth beat as the case may be. In auricular fibrillation, however, each muscle fibre separately contracts and the auricle is in diastole. The stimuli come from the auricle and the ventricular contractions are rapid and irregular. In these two conditions the heart rate is not under the control of the central nervous system.

Regarding the administration of digitalis, Mackenzie recommends 20 minims of the tincture t. i. d. until the physiological effect is shown, usually from the fifth to the seventh day. It is then stopped completely for two days, and half the dose resumed. Signs of sufficient medication are: pulse from 70 to 90, bad dreams, headache, vomiting, diarrhoea, diminished urine and an occasional extrasystole.

The author gives Mackenzie's idea of heart failure, and shows that in cases with regular heart rhythm the question is one of the ability of the heart muscle to do the required amount of work. The various degrees of heart muscle incompetency should be treated with the corresponding amount of rest.

The author relies on the electrocardiograph, clinical polygraph, or the symptoms and physical signs in order to make a diagnosis of cardiac arrhythmia. A rapid pulse from 130 to 160 when at rest and not increased by exercise, indicates auricular flutter. In fibrillation the pulse shows irregular strength of impulses and irregular rate. Sixty to seventy per cent of dropsy cases suffer from fibrillation. The disappearance of a presystolic murmur indicates a fibrillation, also the occurrence of a diastolic diminuendo murmur, in absence of a presystolic murmur, suggests an auricular fibrillation.

C. B. DRAKE.

BOOK REVIEWS

THE DIETARY COMPUTER. (By AMY ELIZABETH POPE, Formerly Instructor in the School of Nursing, Presbyterian Hospital; Instructor in the School of Nursing, St. Luke's Hospital, San Francisco, Cal. Published by G. P. Putnam's Sons, New York and London, The Knickerbocker Press, 1917. Price, \$1.25.)

This small volume is composed mainly of lists of foods, their percentage composition and caloric values. The essentials of a diet, the proportion of protein, fat and carbohydrate, and the estimations of the approximate number of calories required by a human being as determined by various international authorities are all given.

This book should be of definite practical value to the housewife at a time like the present, as well as to the professional dietitian.

C. B. DRAKE.

CANCER, Its Cause and Treatment. (By L. DUNCAN BULKLEY, A. M., M. D., Senior Physician to the New York Skin and Cancer Hospital, etc. Volume II. Published by Paul B. Hoeber, New York, 1917. Price \$1.50.)

The chief value of this book lies in its pointing out that we do not know the cause of cancer as yet. The author has added nothing new to our knowledge of the subject. In fact, a book of this sort warning the profession against early surgery and strongly advocating medical treatment of cancer is dangerous in its influence. Until the author's medical treatment consisting mainly of a meat, alcohol, and coffee free diet, moderate in amount with a potassium salt in some form added thereto shows a higher percentage of cures in cases proved by the microscope than surgery does, the medical profession will not be justified in substituting this line of treatment for surgery. The reviewer cannot agree in every case with the conclusions drawn from statistics quoted in this work.

C. B. DRAKE.

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